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(71)Applicant : MATSUSHITA ELECTRIC IND CO LTD
(72)Inventor : MIYAGAWA NAOYASU
GOTO YASUHIRO
AKIYAMA TETSUYA

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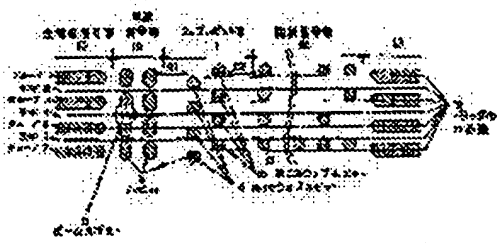
(54) OPTICAL INFORMATION RECORDING MEDIUM AND OPTICAL INFORMATION RECORDING/REPRODUCING DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To stably detect an identification signal in an optical disk for recording a signal in both of a land and a groove.
SOLUTION: A wobbling pit part 11 is provided before an identification signal part 12 composed of prepits 8 arranged being shifted from the center lines of lands 2 to 6 or grooves 1 to 7. Before a beam spot 9 is passed through the identification signal part 12, a sample holding circuit 47 and a correction signal generating circuit sample-hold reflected light quantities from the first and second wobbling pits 14 and 15 and a correction signal is outputted to a synthesizing circuit. The synthesizing circuit cancels an unnecessary residual offset component from a push-pull signal according to the correction signal. Thus, an off-track is eliminated from the identification signal part 12 and an identification signal is stably detected.



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CLAIMS

[Claim(s)]
[Claim 1] It is the optical information record medium which has an adjoining groove truck and an adjoining land truck, and can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, The optical information record medium equipped with the servo control field which has the wobble pit which it has been arranged in the location preceded along this truck from this recognition signal field, and was shifted to the opposite hand about the center line of either this groove truck and this land truck.
[Claim 2] Said wobble pit is an optical information record medium including two or more pairs of pits shifted to the opposite hand by turns about said center line according to claim 1.
[Claim 3] A pair of pit is said optical information record medium according to claim 2 in which a playback synchronizing signal is shown two or more.
[Claim 4] It is the optical information record medium according to claim 1 with which this synchronizing signal section includes the pit train located on the center line of said groove truck or said land truck by arranging the synchronizing signal section which shows the start edge of said wobble pit just before said wobble pit.
[Claim 5] It is the optical information record medium according to claim 1 currently formed in the location which shifted said a part of PURIPITTO train [at least] from the center line of said groove truck or said land truck in said recognition signal field.
[Claim 6] Said recognition signal field is an optical information record medium given [including the pit which shows a truck recognition signal] in claim 1.
[Claim 7] The pit which shows said truck recognition signal is an optical information record medium according to claim 6 currently formed in the location shifted from the center line of said groove truck or said land truck.
[Claim 8] It is the optical information record medium according to claim 1 with which the Puri bit string of said recognition signal field includes the address pit train which shows the corresponding address information of a sector by dividing said groove truck and said land truck into two or more sectors.
[Claim 9] Said groove truck and said land truck are an optical information record medium according to claim 1 currently formed the shape of a spiral, and in the shape of a concentric circle on the disk substrate.
[Claim 10] Said identification information is an optical information record medium containing a track number according to claim 1.
[Claim 11] The part which shows said track number among said PURIPITTO trains which show said recognition signal is an optical information record medium according to claim 10 shifted from the center line of said groove truck or said land truck in the direction which crosses this truck.
[Claim 12] The shift amount of PURIPITTO currently formed in the location shifted from the center line of said groove truck or said land truck among said PURIPITTO trains which show said recognition signal is an optical information record medium according to claim 5 which is the abbreviation quadrant of the pitch of a truck.
[Claim 13] The optical depth or the optical height of said PURIPITTO train which shows said recognition signal is in the depth of said groove truck, abbreviation, etc. by carrying out, and is an optical information record medium according to claim 1.
[Claim 14] The optical depth or the optical height of said PURIPITTO train which shows said recognition signal is an optical information record medium [equal to abbreviation lambda / 4 (lambda is the wavelength of a light beam)] according to claim 1.
[Claim 15] The width of face of abbreviation of said PURIPITTO train which shows said recognition signal is in the width of face of said groove truck by carrying out, and is an optical information record medium according to claim 1.
[Claim 16] An optical information record medium given in claim 1-2 with the larger width of face of the pit train which shows the pit train or said recognition signal of said synchronizing signal section than the width of face of said groove truck.
[Claim 17] The optical information record medium according to claim 1 with which the gap section is prepared between said servo control fields and said recognition signal fields.
[Claim 18] It is the optical information record medium according to claim 1 with which it has the rewritable record layer and this record layer is formed from the phase change die materials which can take an amorphous condition and a crystallized state.
[Claim 19] It is the optical information record medium which has an adjoining groove truck and an adjoining land truck, and can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, It is arranged in the location preceded along this truck from this recognition signal field, and a light beam is used to the optical information record medium equipped with the servo control field which has the wobble pit shifted to the opposite hand about the center line of either this groove truck and this land truck. While the optical spot which is the optical information record regenerative apparatus which performs informational record/playback, and this light beam forms on this optical information media is moving in this truck top The 1st tracking-error detector which outputs the 1st error signal which detects the shift amount from this center line of this optical spot, and shows this shift amount, While this optical spot is moving in this servo control field, the reflected light reinforcement from this wobble pit is detected. The 2nd tracking-error detector which outputs the 2nd error signal which detects the shift amount from this center line of this optical spot, and shows this shift amount, and the amendment circuit which outputs the 3rd tracking signal which amended this 1st error signal based on this 2nd error signal, this -- the optical information

record regenerative apparatus equipped with the tracking controller which performs tracking based on the 3rd tracking signal.
[Claim 20] It is the optical information record medium which has an adjoining groove truck and an adjoining land truck, and can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, It is arranged in the location preceded along this truck from this recognition signal field, and has the servo control field which has the wobble pit shifted to the opposite hand about the center line of either this groove truck and this land truck. The synchronizing signal section which shows the start edge of this wobble pit is arranged just before this wobble pit. This synchronizing signal section As opposed to an optical information record medium including the pit train located on the center line of said groove truck or said land truck The optical system which is the optical information record regenerative apparatus which performs informational record/playback, and irradiates the light beam from the light source at this optical information record medium using a light beam, The migration means to which this light beam moves relatively the optical spot formed on this optical information record medium along the direction where this truck extends, A photodetection means to receive light by two or more light sensing portions, to change the reflected light of this light beam from this optical information record medium into an electrical signal, and to output it as a photodetection signal, A recognition signal reading means to reproduce this recognition signal from this photodetection signal, and while this optical spot is moving in this truck top The 1st tracking-error detector which outputs the 1st error signal which detects the shift amount from this center line of this optical spot, and shows this shift amount, A synchronizing signal detection means to output the reference signal which detects the timing to which this optical spot moves this synchronizing signal section top from this photodetection signal, and shows this timing, While this optical spot is moving in this servo control field, it is based on this reference signal and this photodetection signal. Detect the shift amount from this center line of this optical spot, and it is based on the 2nd tracking-error detector, this 1st error signal, and this 2nd error signal which output the 2nd error signal which shows this shift amount. The optical information record regenerative apparatus characterized by having a synthetic means to output the 3rd error signal, and the tracking control means which controls this migration means based on this 3rd error signal so that this optical spot moves in this truck top.
[Claim 21] Said synthetic means is an optical information record regenerative apparatus according to claim 21 which outputs the result of having added said 2nd error signal to said 1st error signal, as said 3rd error signal.
[Claim 22] Said synthetic means is the optical information record regenerative apparatus [equipped with a recognition signal field detection means to output a field detecting signal while it detects that said optical spot is moving in said recognition signal field and this optical spot is moving in this recognition signal field, and an error signal maintenance means to hold this 3rd error signal while this field detecting signal is outputted] according to claim 21.
[Claim 23] the difference of the dc component of said photodetection signal after the event of said reference signal being inputted, as for said 2nd tracking-error detection means to first time interval, and the dc component of this photodetection signal after this event to second time interval -- taking -- this -- the optical information record and the regenerative apparatus according to claim 21 which generates said 2nd error signal from difference.
[Claim 24] In the field which receives said light beam in which said photodetection means was reflected It is arranged at the symmetry in the direction which crosses said truck, and has two light sensing portions which change into an electrical signal the quantity of light which received light. Said 1st tracking-error detection means this -- a difference operation means to search for the difference of the electrical signal which two light sensing portions output -- having -- said 2nd tracking-error detection means -- this -- optical information record and a regenerative apparatus according to claim 21 equipped with a sum operation means to ask for the sum of this electrical signal that two light sensing portions output.
[Claim 25] The optical information record regenerative apparatus [equipped with a record means to record an information signal on said truck, and the record control means which controls this record means not to record this information signal on said recognition signal field] according to claim 21.
[Claim 26] It is the optical information record medium which has an adjoining groove truck and an adjoining land truck, and can perform informational record or playback to this groove truck and this land truck. The PURIPITTO train which shows the identification information about this groove truck and this land truck, Two or more pits which show the playback synchronizing signal for being arranged in the location preceded along this truck from this buri pit train, and reproducing the identification information of this PURIPITTO train, Two or more pits which show a preparation and this playback synchronizing signal are optical information record media shifted about the center line of either this groove truck and this land truck.
[Claim 27] The Puri bit string which said groove truck and said land truck are divided into two or more sectors, and shows said recognition signal is an optical information record medium including the address pit train which shows the corresponding address information of a sector according to claim 26.
[Claim 28] It is the optical information record medium which has an adjoining groove truck and an adjoining land truck, and can perform informational record or playback to this groove truck and this land truck. The PURIPITTO train which shows the identification information about this groove truck and this land truck, Two or more pits which show the playback synchronizing signal for being arranged in the location preceded along this truck from this buri pit train, and reproducing the identification information of this PURIPITTO train, Two or more pits which show a preparation and this playback synchronizing signal As opposed to the optical information record medium shifted about the center line of either this groove truck and this land truck The optical information record regenerative apparatus equipped with the circuit which compensates tracking offset from two or more pits which are the optical information record regenerative apparatus which perform informational record/playback, and show this playback synchronizing signal using a light beam.
[Claim 29] Both the groove formed the shape of a spiral and in the shape of a concentric circle on the disk substrate and a land are used as a code track. The servo control field which it is [field] the optical information record medium which consists of at least one zone which consists of two or more code tracks, and made at least one period of these grooves move in a zigzag direction, One PURIPITTO which shows a recognition signal is arranged to the lot of a ****** this groove and this land, and receives the center line of this groove or this land in the part or all the center lines of this PURIPITTO. The recognition signal field shifted in the direction which crosses a code track, and this recognition signal field are an optical information record medium characterized by having independently the information signal field where an information signal is recorded by the exposure of a light beam.
[Claim 30] It is the optical information record medium which has an adjoining groove truck and an adjoining land truck,

and can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, The PURIPITTO train which is equipped with the information signal field where an information signal is recorded, and shows this recognition signal by the exposure of a light beam Field number PURIPITTO which shows the field number which shows the sequence of the information field which consist of two this adjoining trucks, Track identity PURIPITTO for detecting whether the spot of a light beam is moving in which truck top of this groove truck and these land trucks is included. It is formed on two abbreviation borderlines of a truck. this field number PURIPITTO is contained in this information field -- this -- The period of field number PURIPITTO which met in the direction vertical to this truck The period of this track identity PURIPITTO that it is set up the twice of a track pitch, and track identity PURIPITTO is formed on the abbreviation borderline of two adjacent information fields, and met in the direction vertical to this truck is an optical information record medium set up by this 4 times track pitch.
[Claim 31] the 1st truck ******** by which said track identity PURIPITTO has been arranged on the same straight line as said field number PURIPITTO train -- this -- to the 1st truck identifier, it is formed ahead of the direction of a truck, and adjoins along a direction vertical to this truck -- this -- the optical information record medium containing the 2nd truck identifier arranged in the medium of the 1st truck identifier according to claim 30.
[Claim 32] An optical information record medium [equipped with the phase change mold record layer which causes a change of state between an amorphous condition and a crystallized state] according to claim 30.
[Claim 33] It is the optical information record medium which has an adjoining groove truck and an adjoining land truck, and can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, The PURIPITTO train which is equipped with the information signal field where an information signal is recorded, and shows this recognition signal by the exposure of a light beam Field number PURIPITTO which shows the field number which shows the sequence of the information field which consist of two this adjoining trucks, Track identity PURIPITTO for detecting whether the spot of a light beam is moving in which truck top of this groove truck and these land trucks is included. It is formed on two abbreviation borderlines of a truck. this field number PURIPITTO is contained in this information field -- this -- The period of field number PURIPITTO which met in the direction vertical to this truck It is set up the twice of a track pitch. Track identity PURIPITTO The period of this track identity PURIPITTO that is formed on the abbreviation borderline of two adjacent information fields, and met in the direction vertical to this truck As opposed to the optical information record medium set up by this 4 times track pitch The optical system which is the optical information record regenerative apparatus which performs informational record/playback, and irradiates the light beam from the light source at this optical information record medium using a light beam, A photodetection means to receive the light beam reflected with this optical information record medium, to change into an electrical signal, and to output as a photodetection signal, The optical information record regenerative apparatus equipped with a recognition signal reading means to read this recognition signal from this photodetection signal, and to output this field number at least, and a truck identifier detection means to output an identifier detecting signal when the signal from this track identity PURIPITTO is detected.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the optical information record medium using both the field in the guide rail (groove) beforehand formed on the optical information record medium, and the field between guide rails (land) as a code track, and the optical information record regenerative apparatus which records an information signal on this.
[0002]
[Description of the Prior Art] In recent years, development of the optical information record medium which can carry out record playback of the information signals, such as an image or a sound signal, is prosperous. There is an optical disk as such an optical information record medium. In the recordable optical disk, a guide rail (groove) is beforehand minced by the substrate of an optical disk, and the code track is formed. Moreover, the field between grooves is called a land. When a laser beam is condensed by the flat part of a groove or a land, record or playback of an information signal is performed.
[0003] In the common optical disk marketed now, an information signal is usually recorded on either a groove or a land, and another side serves as a guard band which separates a ****** truck.
[0004] Drawing 9 is the amplification perspective view of such a conventional optical disk. In this drawing, 85 is a record layer, for example, is formed with the phase change ingredient. 86 is a record pit and 87 is the beam spot of a laser beam. The groove in which 88, 90, and 92 were formed of the guide rail, and 89 and 91 are lands, and the groove is broad compared with the land. Moreover, 93 is PURIPITTO which makes the recognition signal showing the positional information on a disk. In addition, in this drawing, the transparence disk substrate which incident light penetrates is omitted.
[0005] Here, conventionally, in order to make the storage capacity of an optical disk 7 increase, width of face of a land 89 was narrowed and truck spacing was packed. However, if truck spacing is packed, since the angle of diffraction of the reflected light by the groove will become large, there is a trouble that the tracking-error signal for making the beam spot 87 follow with a sufficient precision falls to a truck.
[0006] Moreover, since there is a limitation even if it packs truck spacing only with a width of land, the width of face of a groove must also be narrowed. Since the record pit 86 becomes thin, the problem of amplitude lowering of a regenerative signal produces this.
[0007] On the other hand, as it is in JP,63-57859,B, an information signal is recorded on both a groove and a land, and there is a technique of enlarging track density.
[0008] Drawing 10 is the amplification perspective view of such an optical disk. In this drawing, as for a record layer and 86, 85 is [a record pit and 93] transparence substrates, and the above has given the same sign to the same thing as what was explained in drawing 9 . As for 94, 96, and 98, a groove, and 95 and 97 are lands.
[0009] As shown in this drawing, the width of face of a groove and a land spreads abbreviation etc., and has become. Moreover, 99 is PURIPITTO, is formed in both a groove and a land and is minced at the head of each sector of both code tracks as a recognition signal showing the positional information on an optical disk.
[0010] In this optical disk, the record pit 86 is formed in both a groove and a land as shown in this drawing, and although the period of a groove is equal to the optical disk of drawing 9 , spacing of record pit trains has dropped to 1/2. Thereby, the storage capacity of an optical disk doubles.
[0011] Furthermore, in the rewritable mold optical disk, although it was indispensable to have recorded beforehand the recognition signal showing the positional information on a disk etc., and to have placed it on a disk, this invention persons already proposed the technique which records one recognition signal in the medium of a groove and a land to the groove and land of a ****** lot in JP,6-176404,A.
[0012]
[Problem(s) to be Solved by the Invention] However, in the above optical information record media, since a track pitch serves as half [conventional], truck follow-up control must be further carried out to high degree of accuracy rather than before. When a recognition signal is especially allotted in the medium of a land and a groove, the beam spot has a technical problem of it becoming impossible to detect a recognition signal, when the beam spot shifts from a truck core to the side on which the recognition signal is not recorded, in order only for the one side to start PURIPITTO.
[0013] This invention aims at offering the optical information record medium which can solve the above-mentioned technical problem, and optical information record and a regenerative apparatus.
[0014]
[Means for Solving the Problem] The optical information record medium of this invention has an adjoining groove truck and an adjoining land truck. It is the optical information record medium which can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, It is arranged in the location preceded along this truck from this recognition signal field, and has the servo control field which has the wobble pit shifted to the opposite hand about the center line of either this groove truck and this land truck, and the above-mentioned object is attained by that.
[0015] Said wobble pit may include two or more pairs of pits shifted to the opposite hand by turns about said center line.
[0016] With a desirable operation gestalt, said two or more pairs of pits show a playback synchronizing signal.
[0017] With the desirable operation gestalt, the synchronizing signal section which shows the start edge of said wobble

pit is arranged just before said wobble pit, and this synchronizing signal section includes the pit train located on the center line of said groove truck or said land truck.
[0018] With the desirable operation gestalt, said a part of PURIPITTO train [at least] is formed in the location shifted from the center line of said groove truck or said land truck in said recognition signal field.
[0019] With the desirable operation gestalt, said recognition signal field includes the pit which shows a truck recognition signal.
[0020] With the desirable operation gestalt, the pit which shows said truck recognition signal is formed in the location shifted from the center line of said groove truck or said land truck.
[0021] With the desirable operation gestalt, said groove truck and said land truck are divided into two or more sectors, and the Puri bit string of said recognition signal field includes the address pit train which shows the corresponding address information of a sector.
[0022] Said groove truck and said land truck are formed the shape of a spiral, and in the shape of a concentric circle on the disk substrate. Said identification information contains the track number.
[0023] With the desirable operation gestalt, the part which shows said track number among said PURIPITTO trains which show said recognition signal is shifted from the center line of said groove truck or said land truck in the direction which crosses this truck.
[0024] The shift amount of PURIPITTO currently formed in the location shifted from the center line of said groove truck or said land truck with the desirable operation gestalt among said PURIPITTO trains which show said recognition signal is the abbreviation quadrant of the pitch of a truck.
[0025] the optical depth or the optical height of said PURIPITTO train which shows said recognition signal with a desirable operation gestalt -- the depth of said groove truck, and abbreviation -- it is equal.
[0026] With a desirable operation gestalt The optical depth or the optical height of said PURIPITTO train which shows said recognition signal is equal to abbreviation lambda / 4 (lambda is the wavelength of a light beam).
[0027] the width of face of said PURIPITTO train which shows said recognition signal with a desirable operation gestalt -- the width of face of said groove truck -- abbreviation -- it is equal.
[0028] The width of face of the pit train which shows the pit train or said recognition signal of said synchronizing signal section with a desirable operation gestalt is larger than the width of face of said groove truck.
[0029] With the desirable operation gestalt, the gap section is prepared between said servo control fields and said recognition signal fields.
[0030] With a certain operation gestalt, it has the rewritable record layer and this record layer is formed from the phase change die materials which can take an amorphous condition and a crystallized state.
[0031] The optical information record regenerative apparatus of this invention has an adjoining groove truck and an adjoining land truck. It is the optical information record medium which can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, It is arranged in the location preceded along this truck from this recognition signal field, and a light beam is used to the optical information record medium equipped with the servo control field which has the wobble pit shifted to the opposite hand about the center line of either this groove truck and this land truck. While the optical spot which is the optical information record regenerative apparatus which performs informational record/playback, and this light beam forms on this optical information media is moving in this truck top The 1st tracking-error detector which outputs the 1st error signal which detects the shift amount from this center line of this optical spot, and shows this shift amount, While this optical spot is moving in this servo control field, the reflected light reinforcement from this wobble pit is detected. The 2nd tracking-error detector which outputs the 2nd error signal which detects the shift amount from this center line of this optical spot, and shows this shift amount, the amendment circuit which outputs the 3rd tracking signal which amended this 1st error signal based on this 2nd error signal -- this -- based on the 3rd tracking signal, it has the tracking controller which performs tracking, and the above-mentioned object is attained by that.
[0032] Other optical information record regenerative apparatus of this invention have an adjoining groove truck and an adjoining land truck. It is the optical information record medium which can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, It is arranged in the location preceded along this truck from this recognition signal field, and has the servo control field which has the wobble pit shifted to the opposite hand about the center line of either this groove truck and this land truck. The synchronizing signal section which shows the start edge of this wobble pit is arranged just before this wobble pit. This synchronizing signal section As opposed to an optical information record medium including the pit train located on the center line of said groove truck or said land truck The optical system which is the optical information record regenerative apparatus which performs informational record/playback, and irradiates the light beam from the light source at this optical information record medium using a light beam, The migration means to which this light beam moves relatively the optical spot formed on this optical information record medium along the direction where this truck extends, A photodetection means to receive light by two or more light sensing portions, to change the reflected light of this light beam from this optical information record medium into an electrical signal, and to output it as a photodetection signal, A recognition signal reading means to reproduce this recognition signal from this photodetection signal, and while this optical spot is moving in this truck top The 1st tracking-error detector which outputs the 1st error signal which detects the shift amount from this center line of this optical spot, and shows this shift amount, A synchronizing signal detection means to output the reference signal which detects the timing to which this optical spot moves this synchronizing signal section top from this photodetection signal, and shows this timing, While this optical spot is moving in this servo control field, it is based on this reference signal and this photodetection signal. The 2nd tracking-error detector which outputs the 2nd error signal which detects the shift amount from this center line of this optical spot, and shows this shift amount, A synthetic means to output the 3rd error signal based on this 1st error signal and this 2nd error signal, Based on this 3rd error signal, it has the tracking control means which controls this migration means so that this optical spot may move in this truck top, and the above-mentioned object is attained by that.
[0033] With a certain operation gestalt, said synthetic means outputs the result of having added said 2nd error signal to said 1st error signal, as said 3rd error signal.
[0034] Said synthetic means is equipped with a recognition signal field detection means to output a field detecting signal while it detects that said optical spot is moving in said recognition signal field and this optical spot is moving in

this recognition signal field, and an error signal maintenance means to hold this 3rd error signal while this field detecting signal is outputted, with a certain operation gestalt.
[0035] the difference of the dc component of said photodetection signal after the event of said reference signal being inputted with a certain operation gestalt, as for said 2nd tracking-error detection means to first time interval, and the dc component of this photodetection signal after this event to second time interval -- taking -- this -- said 2nd error signal is generated from difference.
[0036] In the field which receives said light beam in which said photodetection means was reflected with a certain operation gestalt It is arranged at the symmetry in the direction which crosses said truck, and has two light sensing portions which change into an electrical signal the quantity of light which received light. Said 1st tracking-error detection means this -- a difference operation means to search for the difference of the electrical signal which two light sensing portions output -- having -- said 2nd tracking-error detection means -- this -- it has a sum operation means to ask for the sum of this electrical signal that two light sensing portions output.
[0037] With a certain operation gestalt, it has a record means to record an information signal on said truck, and the record control means which controls this record means not to record this information signal on said recognition signal field.
[0038] The optical information record medium of further others of this invention has an adjoining groove truck and an adjoining land truck. The PURIPITTO train which is the optical information record medium which can perform informational record or playback to this groove truck and this land truck, and shows the identification information about this groove truck and this land truck, It is arranged in the location preceded along this truck from this buri pit train, and has two or more pits which show the playback synchronizing signal for reproducing the identification information of this PURIPITTO train. Two or more pits which show this playback synchronizing signal are shifted about the center line of either this groove truck and this land truck, and the above-mentioned object is attained by that.
[0039] With a certain operation gestalt, said groove truck and said land truck are divided into two or more sectors, and the Puri bit string which shows said recognition signal includes the address pit train which shows the corresponding address information of a sector.
[0040] It is the optical information record medium which has a certain adjoining groove truck and adjoining land truck, and can perform informational record or playback to this groove truck and this land truck. The PURIPITTO train which shows the identification information about this groove truck and this land truck, Two or more pits which show the playback synchronizing signal for being arranged in the location preceded along this truck from this buri pit train, and reproducing the identification information of this PURIPITTO train, Two or more pits which show a preparation and this playback synchronizing signal As opposed to the optical information record medium shifted about the center line of either this groove truck and this land truck Using a light beam, it is the optical information record regenerative apparatus which performs informational record/playback, and it has the circuit which compensates tracking offset from two or more pits which show this playback synchronizing signal, and the above-mentioned object is attained by that.
[0041] Other optical information record media of this invention use as a code track both the groove formed the shape of a spiral, and in the shape of a concentric circle on the disk substrate, and a land. The servo control field which it is [field] the optical information record medium which consists of at least one zone which consists of two or more code tracks, and made at least one period of these grooves move in a zigzag direction, One PURIPITTO which shows a recognition signal is arranged to the lot of a ****** this groove and this land, and receives the center line of this groove or this land in the part or all the center lines of this PURIPITTO. The recognition signal field shifted in the direction which crosses a code track, and this recognition signal field have independently the information signal field where an information signal is recorded by the exposure of a light beam, and the above-mentioned object is attained by that.
[0042] The optical information record medium of further others of this invention has an adjoining groove truck and an adjoining land truck. It is the optical information record medium which can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, The PURIPITTO train which is equipped with the information signal field where an information signal is recorded, and shows this recognition signal by the exposure of a light beam Field number PURIPITTO which shows the field number which shows the sequence of the information field which consist of two this adjoining trucks, Track identity PURIPITTO for detecting whether the spot of a light beam is moving in which truck top of this groove truck and these land trucks is included. It is formed on two abbreviation borderlines of a truck. this field number PURIPITTO is contained in this information field -- this -- The period of field number PURIPITTO which met in the direction vertical to this truck It is set up the twice of a track pitch. Track identity PURIPITTO It is formed on the abbreviation borderline of two adjacent information fields, and the period of this track identity PURIPITTO that met in the direction vertical to this truck is set up by this 4 times track pitch, and the above-mentioned object is attained by that.
[0043] the 1st truck identifier by which said track identity PURIPITTO has been arranged on the same straight line as said field number PURIPITTO train -- this -- to the 1st truck identifier, it is formed ahead of the direction of a truck, and adjoins along a direction vertical to this truck -- this -- the above-mentioned object is attained by that including the 2nd truck identifier arranged in the medium of the 1st truck identifier.
[0044] With a certain operation gestalt, it has the phase change mold record layer which causes a change of state between an amorphous condition and a crystallized state.
[0045] The optical information record regenerative apparatus of this invention has an adjoining groove truck and an adjoining land truck. It is the optical information record medium which can perform informational record or playback to this groove truck and this land truck. The recognition signal field in which the PURIPITTO train which shows the identification information about this groove truck and this land truck was formed, The PURIPITTO train which is equipped with the information signal field where an information signal is recorded, and shows this recognition signal by the exposure of a light beam Field number PURIPITTO which shows the field number which shows the sequence of the information field which consist of two this adjoining trucks, Track identity PURIPITTO for detecting whether the spot of a light beam is moving in which truck top of this groove truck and these land trucks is included. It is formed on two abbreviation borderlines of a truck. this field number PURIPITTO is contained in this information field -- this -- The period of field number PURIPITTO which met in the direction vertical to this truck It is set up the twice of a track pitch. Track identity PURIPITTO The period of this track identity PURIPITTO that is formed on the abbreviation borderline of two adjacent information fields, and met in the direction vertical to this truck As opposed to the optical

information record medium set up by this 4 times track pitch The optical system which is the optical information record regenerative apparatus which performs informational record/playback, and irradiates the light beam from the light source at this optical information record medium using a light beam, A photodetection means to receive the light beam reflected with this optical information record medium, to change into an electrical signal, and to output as a photodetection signal, A recognition signal reading means to read this recognition signal from this photodetection signal, and to output this field number at least, When the signal from this track identity PURIPITTO is detected, it has a truck identifier detection means to output an identifier detecting signal, and the above-mentioned object is attained by that.

[0046]

[Embodiment of the Invention] Hereafter, the example of the optical information record medium by this invention, and an optical information record and a regenerative apparatus is explained.

[0047] In each following example, the case of the optical disk which used the record ingredient of the phase change mold in which an account rec/play student is possible which records with a reflection coefficient as an optical information record medium is taken up. Moreover, as a control system of a revolution of an optical disk, the case where include-angle rate regularity (CAV: the abbreviation for a constant angular velocity) is used is explained.

[0048] However, an optical information record medium applicable to this invention may be not only a reflective mold but a transparency mold that what is necessary is just the optical record medium which makes a land and a groove applicable to record at least. Moreover, what is necessary is just the medium which can record and reproduce information as a recording method with the so-called optical means, such as a phase change mold, an optical MAG mold, and a coloring matter mold.

[0049] (Example 1) The 1st example of this invention is explained, referring to drawing 1 .

[0050] Drawing 1 is the flat-surface enlarged drawing of the body of the optical disk of this example.

[0051] In drawing 1 , as for 1, 3, 5, and 7, a groove, and 2, 4 and 6 are lands, and it has come [each other] to spread the width of face of a land and a groove. 8 is PURIPITTO and 9 is the beam spot.

[0052] The section shown in 10 is the synchronizing signal section, a groove is not formed but PURIPITTO is formed on the extension wire of a groove in this section. Width of face is large rather than other PURIPITTO as PURIPITTO of this section is shown in drawing.

[0053] Moreover, the depth of PURIPITTO is equal to the difference of elevation of a groove and a land. The depth of a groove can be carried out by optical length from abbreviation lambda / 10 to abbreviation lambda / 4 (lambda is the wavelength of a reading laser beam). Since the cross talk from an adjoining truck can be reduced as it is in JP,5-282705,A especially, abbreviation lambda / 7 to abbreviation lambda / 5 are suitable for the depth of a groove.

[0054] The section shown in 11 is the wobble pit section, a groove is not formed but PURIPITTO is arranged [in this section] bordering on the center line of each truck in the trace direction right and left and order.

[0055] When the beam spot 9 traces in the direction of an arrow head, the direction which passes PURIPITTO of the direction through which the beam spot 9 passes previously to the 1st wobble pit and the back will be called the 2nd wobble pit.

[0056] The 1st wobble pit and the 2nd wobble pit are shared by the ****** code track. Therefore, although the 1st wobble pit 14 is located in left-hand side to the travelling direction of the beam spot 9 when the beam spot 9 traces a land, when the beam spot 9 traces a groove, the 1st wobble pit 14 will be located in right-hand side to the travelling direction of the beam spot 9.

[0057] Although the 2nd wobble pit 15 is located in right-hand side to the travelling direction of the beam spot 9 when the beam spot 9 traces a land reversely, when the beam spot 9 traces a groove, the 2nd wobble pit 15 will be located in left-hand side to the travelling direction of the beam spot 9. And the amount of tracking errors is detectable with the difference of the return quantity of light in case the beam spot 9 is on the 1st wobble pit, and the return quantity of light when being on the 2nd wobble pit.

[0058] The reason the amount of tracking errors is obtained is detailed to JP,61-224145,A.

[0059] The section shown in 12 is the recognition signal section, and a groove is not formed in this section. PURIPITTO showing a recognition signal is formed every other truck between the center line of a groove, and the center line of a land. In addition, the recognition signal of this invention is exactly the so-called recognition signal of information record media, such as a truck on an information record medium and/or positional information of a sector, a sector mark, and a criteria synchronizing signal.

[0060] When the beam spot passes through a recognition signal field, in order for a part of beam spot to pass through a PURIPITTO top, also in which of a land and a groove, the amount of reflected lights receives a modulation by PURIPITTO. Therefore, also in a land, a recognition signal becomes refreshable also in a groove.

[0061] In this example, it is not just before the main information signal section 13, and the wobble pit section 11 is arranged in front of the recognition signal section 12, and a tracking-error signal is amended using this wobble pit section 11. For this reason, before turbulence of the tracking-error signal by the pre pit of the recognition signal section 12 arises, amendment of a tracking-error signal is started, consequently turbulence of the tracking-error signal by the pre pit of the recognition signal section 12 is suppressed very small.

[0062] Since amendment of a tracking error will be started after turbulence of the tracking-error signal by the pre pit of the recognition signal section 12 arises if the wobble pit section 11 is arranged after the recognition signal section 12, sufficient amendment is not performed. Moreover, before amendment of a tracking error is completed in such a case, since the spot of a light beam reaches the main information signal section 13, in the head section of the main information signal section 13, a possibility that gap may have arisen is in tracking.

[0063] The section shown in 13 is the main information signal section, and a record pit is formed as well as the conventional optical disk according to the information signal of an image, voice, or computer data. The alternate long and short dash line shown in 19 is a center line of each groove or a land. Moreover, before and after the wobble pit section 11, as shown in drawing, gaps G1 and G2 are formed.

[0064] The optical disk of this example is divided into the sector of plurality [round / truck], and the synchronizing signal section 10 shown in the head of each sector at drawing 1 , the wobble pit section 11, and the recognition signal section 12 are allotted. In corresponding to CAV control, each sector is arranged at a radial the disk radial. Moreover, two or more trucks are collectively made into one zone, an entire disk is divided into two or more zones, and it may be made to perform CAV control in each zone.

[0065] Next, the track format of the optical disk of this example is explained. Drawing 2 is the block diagram of a code track. In this drawing, 16 is a groove and 17 is a land. As for each truck, the code-track number is assigned through

the land and the groove for every round.
[0066] From an inner circumference side, the beam spot is traced clockwise, and goes to a periphery side, and T, T+1, T+2, T+3, and T+4 show the code-track number in this drawing.
[0067] 18 is the sector to which each truck carried out N division of the 1 round, and the sector number is respectively given from No. 1 to No. N.
[0068] Since the code track is forming the spiral, in the groove, the No. N sector of a No. T truck and the No. 1 sector of a No. T+2 truck are connected. Moreover, on the land, the No. N sector of a No. T+1 truck and the No. 1 sector of a No. T+3 truck are connected. These code-track numbers and sector numbers are beforehand formed on the disk as above-mentioned PURIPITTO.
[0069] In this example, the address data of the code track of a groove are recorded as PURIPITTO. While tracing the code track of a land, 1 is only added to the track number of the address data which reproduced PURIPITTO, and the present positional information can be acquired. Moreover, radially, since the sector number is the same with ****** sectors, it can use the signal which reproduced PURIPITTO with the code track of a groove and a land as positional information as it is.
[0070] Drawing 3 is the format explanatory view of the recognition signal per 1 sector. As shown in this drawing, one sector consists of the synchronizing signal section, the wobble pit section, the recognition signal section, and the main information signal field, and the recognition signal field consists of each block of a sector mark, an alignment pattern, the address mark, a track number, and a sector number. work of each block -- one following sector mark: -- pattern for 2 synchronizations: which shows that it is the head of each sector -- it is as 4 track numbers which show that the 3 address-mark:address data which make the clock for address-data playback generate start, and sector number:address data being shown. Among these, a sector mark, the pattern for a synchronization, and the address mark are the same with all sectors.
[0071] Next, the optical information record and the regenerative apparatus which can record, reproduce or eliminate an information signal to the optical disk of this example are explained, referring to drawing 4 .
[0072] The optical disk 21 of drawing 4 has said structure, and is equipped with the code track 22 formed from the land and the groove. According to this optical information record and regenerative apparatus, to an optical disk 21, information can be recorded or it can reproduce.
[0073] First, the configuration of the optical head 29 is explained. The optical head 29 is equipped with the semiconductor laser component 23, the collimate lens 24 with which semiconductor laser 23 makes parallel light the laser beam by which outgoing radiation was carried out, the half mirror 25, the objective lens 26 which makes the information side of an optical disk 21 condense the parallel light which passed the half mirror 25, the photodetector 27 which receives the reflected light from an optical disk 21 which passed through the objective lens 26 and the half mirror 25, and the actuator 28 which supports an objective lens 26. The photodetector 27 has two light sensing portions 27a and 27b made parallel 2 ****s with the direction of a truck of a disk in order to generate a tracking-error signal. These components are attached in the head base which is not illustrated.
[0074] The output (detecting signal outputted from the light sensing portions 27a and 27b of a photodetector 27) from an optical pickup 29 is inputted into the differential amplifier 30 and a summing amplifier 37. The output of the differential amplifier 30 is inputted into a low pass filter (LPF) 31. LPF31 outputs the difference signal which the differential amplifier 30 outputs to the polarity-reversals circuit 32 as reception and a signal S1. The polarity-reversals circuit 32 outputs a signal S2 for the signal S1 which LPF31 outputs, and the control signal L4 from the system controller 56 mentioned later to reception and the synthetic circuit 33.
[0075] On the other hand, the output (sum signal) of a summing amplifier 37 is inputted into a high-pass filter (HPF) 38. HPF38 outputs the high frequency component of a sum signal to the 1st waveform shaping circuit 39, the 2nd corrugating circuit 42, and the synchronizing signal detector 45. The 1st waveform shaping circuit 39 outputs the high frequency component of a sum signal to the regenerative-signal processing circuit 40 which mentions reception and a digital signal later from HPF38. The regenerative-signal processing circuit 40 outputs the reproduced information signal to an output terminal 41. The 2nd waveform shaping circuit 42 outputs the high frequency component of a sum signal to the address regenerative circuit 43 which mentions reception and a digital signal later from HPF38. The address regenerative circuit 43 outputs a digital signal to the address calculation circuit 44 which mentions reception and the 1st address data later from the 2nd waveform shaping circuit 42. The address calculation circuit 44 outputs the 2nd address data for a control signal L1 to reception and a system controller 56 from the address regenerative circuit 43 to the 1st address data, and a system controller 56.
[0076] The synchronizing signal detector 45 outputs the high frequency component of a sum signal to reception from HPF38, and outputs a synchronous detecting signal to the timing generating circuit 46. As for the timing generating circuit 46, a synchronizing signal detecting signal outputs a timing pulse to reception and a sample hold circuit 47. A sample hold circuit 47 outputs a sampling signal for a timing pulse to reception and the amendment signal generation circuit 48 from a summing amplifier 37 to a sum signal, and the timing generating circuit 46. The amendment signal generation circuit 48 outputs amendment signal S4 for a sampling signal to reception and the synthetic circuit 48 from a sample hold circuit 47.
[0077] The synthetic circuit 33 outputs a signal S3 for the signal S2 from the polarity-reversals circuit 32, and signal S4 from the amendment signal generation circuit 48 to reception and the tracking control circuit 34.
[0078] The tracking control circuit 34 outputs a tracking control signal for the output signal S3 of the synthetic circuit 33, and the control signal L1 from a system controller 56 to one of two input terminals, reception and the 1st selector 35. The 1st selector 35 outputs a driving signal for a control signal L5 to reception, the actuation circuit 36, and the traverse control circuit 50 from the jump pulse generating circuit 49 to the tracking control circuit 34 to a tracking control signal, a driving pulse, and a system controller 56.
[0079] A driving signal is inputted from the 1st selector 35, and the actuation circuit 36 outputs an actuation current to an actuator 28.
[0080] Since it differs, the amplification factor of the 1st waveform shaping circuit 39 and the 2nd waveform shaping circuit 42 has been changed with the playback amplitude of the main information signal by the record mark, and the recognition signal by PURIPITTO.
[0081] The jump pulse generating circuit 49 outputs control signal L6 to reception from a system controller 56, and outputs a driving pulse to the 1st selector 35.
[0082] The traverse control circuit 50 outputs an actuation current for the 1st selector 35 to a system controller 56 to the control signal L2, and a tracking control signal to reception and the traverse motor 51.

[0083] The traverse motor 51 is a motor made to move the optical head 29 to radial [of an optical disk 21]. Moreover, a spindle motor 52 is a motor made to rotate an optical disk 21.
[0084] A system controller 56 to the information signal of the image voice from the external input terminal 54, computer data, etc. and the control signal L3 are inputted, and the record digital disposal circuit 53 is outputted to the laser actuation circuit 55 which mentions a record signal later. The laser actuation circuit 55 outputs [system controller / 56] an actuation current for a record signal to reception and semiconductor laser 23 from a control signal L3 and the record digital disposal circuit 53.
[0085] A system controller 56 outputs a control signal L1 - L6 for the 2nd address data to reception, the tracking control circuit 34, the traverse control circuit 50, the record digital disposal circuit 53, the laser actuation circuit 55, the polarity-reversals circuit 32, the address calculation circuit 44, the 1st selector 35, and the jump pulse generating circuit 49 from the address calculation circuit 44.
[0086] Actuation of the above-mentioned optical information record and regenerative apparatus is explained referring to drawing 4 .
[0087] First, the actuation at the time of playback of an information signal is explained.
[0088] The laser actuation circuit 55 serves as a playback mode, passes an actuation current to semiconductor laser 23, and is made to emit light by fixed reinforcement with the control signal L3 from a system controller 56. On the other hand, according to the control signal L2 from a system controller 56, the traverse control circuit 50 outputs an actuation current to the traverse motor 51, and moves the optical head 29 to a target truck.
[0089] The laser beam emitted from semiconductor laser 23 is made into parallel light with a collimate lens 24, and it converges it on an optical disk 21 with an objective lens 26 through a beam splitter 25.
[0090] The light beam reflected by the optical disk 21 has the information on a code track 22 by diffraction, and is drawn by the beam splitter 25 on a photodetector 27 through an objective lens 26.
[0091] Light sensing portions 27a and 27b change into an electrical signal quantity of light change of a light beam which carried out incidence, and output it to the differential amplifier 30 and a summing amplifier 37, respectively. The differential amplifier 30 takes differential, after carrying out I-V conversion of each input current, and it outputs it as a difference signal.
[0092] LPF31 extracts a low-frequency component from this differential signal, and outputs it to the polarity-reversals circuit 32 as a signal S1. According to the control signal L4 inputted from a system controller 56, the polarity-reversals circuit 32 passes a signal S1 as it is, or reverses the polarity of positive/negative, and is outputted to the synthetic circuit 33 as a signal S2.
[0093] Here, when it is a groove, it is made to pass as it is, and when a truck to record or reproduce is a land, it makes it reversed.
[0094] The synthetic circuit 33 adds signal S4 from the amendment signal generation circuit 48 to a signal S2, and outputs it to the tracking control circuit 34 as a signal S3. Here, a signal S2 is the so-called push pull signal, and supports the amount of tracking errors between the beam spots and the code tracks which were condensed by the information side. Although signal S4 is explained later, it corresponds to the amount of offset of a push pull signal, and the synthetic circuit 33 cancels the unnecessary offset component contained in a signal S2 by adding signal S4.
[0095] According to the level of the inputted signal S3, the tracking control circuit 34 outputs a tracking control signal to the actuation circuit 36 through the 1st selector 35, and carries out position control of the actuation circuit 36 in the direction in which a sink is crossed for an actuation current and it crosses a code track 22 for an objective lens 26 to an actuator 28 according to this signal. Thereby, the beam spot scans a code-track 22 top correctly.
[0096] Moreover, a tracking control signal is inputted into the traverse control circuit 50, it drives the traverse motor 51 according to the low-pass component, and moves the optical head 29 gradually radially in accordance with reproductive progress.
[0097] Here, the 1st selector 35 has connected the input side of the actuation circuit 36, and the output side of the jump pulse generating circuit 49 with the control signal L5 from a system controller 56. When moving the beam spot between code tracks (i.e., only when carrying out the track jump of the control signal L5), it connects the input side of the actuation circuit 36 to the jump pulse generating circuit 49, and it makes it connect with the 1st selector 35 in the tracking control circuit 34 at the time of others.
[0098] Position control of the objective lens 26 is carried out to a disk side and a perpendicular direction by the focal control circuit which is not illustrated so that the beam spot may connect a focus correctly on a disk on the other hand.
[0099] If the beam spot is correctly positioned on a code track 22, after a summing amplifier 37 carries out I-V conversion of the output current of light sensing portions 27a and 27b, it will be added, and will be outputted to HPF38 as a sum signal.
[0100] HPF38 cuts an unnecessary low-frequency component from a sum signal, passes the main information signal and address signal which are a regenerative signal with an analog wave, and is outputted to the 1st waveform shaping circuit 39, 2nd waveform shaping circuit 42, and synchronizing signal detector 45.
[0101] A data slice is carried out with the 2nd threshold, the address signal of an analog wave is used as pulse shape, and the 2nd waveform shaping circuit 42 outputs it to the address regenerative circuit 43.
[0102] The address regenerative circuit 43 restores to the inputted digital address signal, and outputs it to the address calculation circuit 44 as the 1st address data.
[0103] The address calculation circuit 44 discriminates whether the truck which the current beam spot is scanning is a land, or it is a groove from a control signal L4, if it is a land, will add 1 to the track number of the 1st address data, and will output it to a system controller 56 as the 2nd address data with a sector number.
[0104] It judges whether the 1st system controller 56 has the current beam spot in the address of ****** based on this 2nd address signal. If it is the target address, a control signal L4 and L5 grade will be maintained as it is, and the beam spot will be made to trace the main information signal section succeedingly. While the beam spot is tracing the main information signal section, the 1st waveform shaping circuit 39 carries out a data slice with the 1st threshold, makes a digital signal the main information signal of an analog wave inputted through a photodetector 27, a summing amplifier 37, and HPF38, and outputs it to the regenerative-signal processing circuit 40.
[0105] The regenerative-signal processing circuit 40 restores to the inputted digital main information signal, processes an error correction etc. henceforth, and outputs it to an output terminal 41 as an image sound signal etc.
[0106] When the beam spot passes the synchronizing signal section, the synchronizing signal detector 45 detects a synchronizing signal from the regenerative signal inputted through a photodetector 27, a summing amplifier 37, and

HPF38, and outputs a synchronous detecting signal to the timing generating circuit 46. If a synchronous detecting signal is inputted, the timing generating circuit 46 will set fixed time difference, and will output two timing pulses T1 and T2 to a sample hold circuit 47.
[0107] Here, as for T1, the beam spot is outputted when [of the 1st wobble pit 14] coming right above exactly, and T2 is beforehand decided in consideration of the distance between the synchronizing signal [on an optical disk 21], 1st, and 2nd wobble pits, and the transit rate of the beam spot so that the beam spot may be outputted, when [of the 2nd wobble pit 15] coming right above exactly.
[0108] Moreover, as for the gap AG1 in drawing 1 , only the distance which the beam spot will pass by the time it detects a synchronizing signal and outputs a timing pulse, after the beam spot 9 passes the synchronizing signal section 10 is taken.
[0109] If T1 and T2 are inputted, a sample hold circuit 47 will carry out sample hold of the electrical-potential-difference value of the sum signal inputted from the summing amplifier 37 at the event, and will output it to the amendment signal generation circuit 48 as sampling signals SP1 and SP2, respectively.
[0110] The amendment signal generation circuit 48 takes the difference of SP1 and SP2, is made to amplify or decrease it with the fixed amplification factor G1, and is outputted to the synthetic circuit 33 as amendment signal S4. The synthetic circuit 33 adds amendment signal S4 to the push pull signal S2 inputted from the polarity-reversals circuit 32, cancels a residual offset component, and outputs it to the tracking control circuit 34 as S3 which is a more accurate tracking-error signal.
[0111] The residual offset component canceled here cannot cancel thoroughly the gap with the beam spot and a truck center line in the tracking control only using S2, if this exists by DC offset of S2 produced with the radial inclination of a disk etc. S3 is held at a value just before beginning to pass until the beam spot 9 finishes passing the recognition signal section 12. Thereby, big fluctuation of the tracking-error signal resulting from the gap to the beam spot of PURIPITTO in the recognition signal section can be prevented. Therefore, the beam spot 9 traces the code-track core 19 top to high degree of accuracy stably. And since amendment of the residual offset by amendment signal S4 is performed before the beam spot reaches the recognition signal section, it can read a recognition signal to stability.
[0112] In addition, only the distance which the beam spot 9 will pass by the time, as for the gap G2 in drawing 1 , the synthetic circuit 33 outputs amendment signal S4, after the beam spot 9 passes through the 2nd wobble pit 15 is taken. By carrying out like this, since the beam spot 9 will begin to trace the recognition signal section 12 after residual offset of tracking control is removed, it is avoidable that the part of the head of the recognition signal section 12 is incorrect-detected for an off-track.
[0113] A system controller 56 tells the record digital disposal circuit 53 and the laser actuation circuit 55 about being a recording mode with a control signal L3 at the time of record. The record digital disposal circuit 53 adds an error correcting code etc. to an image sound signal, computer data, etc. which were inputted from the external input terminal 54, and outputs it to the laser actuation circuit 55 as an encoded record signal. If the laser actuation circuit 55 is set as a recording mode by the control signal L3, the laser actuation circuit 55 will modulate the actuation current which carries out a seal of approval to semiconductor laser 23 according to a record signal. By this, the beam spot irradiated on an optical disk 21 carries out on-the-strength change according to a record signal, and a record pit is formed.
[0114] On the other hand, at the time of playback, the laser actuation circuit 55 is set as a playback mode by the control signal L3, and an actuation current is controlled to emit light by fixed reinforcement weaker than the time of a recording mode in semiconductor laser 23.
[0115] While each above actuation is performed, a spindle motor 52 rotates an optical disk 21 with a fixed angular velocity.
[0116] Next, the actuation (it is henceforth called seeking) for which the beam spot is moved to the target address is further explained to a detail. If the address which starts record/playback is specified, a system controller 56 will judge the sector which has the sector of the specified address in a land, or the sector in a groove with reference to an address map etc., and will output a judgment signal as L4.
[0117] Here, it is assumed at the time of a groove that L4 is set to Lo level and L4 is set to Hi level at the time of a land. When a starting address is the address in a land, the polarity-reversals circuit 32 carries out the polarity reversals of the input signal, and outputs at the time of the address in a groove, without changing a polarity. Moreover, the tracking control circuit 34 is made to choose it as the 1st selector 35 as an input place of the actuation circuit 36 through a control signal L5. At this time, the tracking control circuit 34 is in the condition of not outputting a tracking control signal with a control signal L1.
[0118] Next, send a control signal L2 to the traverse control circuit 50, the traverse motor 51 is made to drive, and coarse seeking is performed. This migration calculates the truck number between both beforehand from the difference of the address value for example, before migration, and a target address value, and is performed by comparing with the crossing truck number obtained from a tracking-error signal during migration.
[0119] Next, the tracking control circuit 34 is made to output a tracking control signal to the actuation circuit 36 and the traverse control circuit 50, and is made to trace the beam spot on a land or a groove with a control signal L1. Completion of tracking drawing in performs playback of the address data from the recognition signal section. That is, the 1st address data are inputted into the address calculation circuit 44 through a photodetector 27, a summing amplifier 37, HPF38, the 2nd waveform shaping circuit 42, and the address regenerative circuit 43.
[0120] When a signal L4 is Lo, the address calculation circuit 44 considers that the 1st inputted address data are the current address, and outputs them to a system controller 56 as the 2nd address data. On the other hand, when a signal L4 is Hi, 1 is added to the track number of address data, and it outputs to a system controller 56 as the 2nd address data.
[0121] A system controller 56 compares the 2nd address data and target address value, and the difference of both track number connects one or more trucks of the outputs of the jump pulse generating circuit 49 and the inputs of the actuation circuit 36 to the 1st selector 35 through a control signal L5 at a certain time. Moreover, it changes into the condition of not outputting a driving signal to the traverse motor 51 through a control signal L2 in the traverse control circuit 50. Then, the actuation circuit 36 is made to output the driving pulse corresponding to a track number difference to the jump pulse generating circuit 49 through signal L6.
[0122] Only the number specified as the actuator 28 by a sink and the beam spot carries out [circuit / 36 / actuation] the track jump of the actuation current corresponding to a driving pulse. If the jump of the specified number is completed, after tracking drawing in will be performed, playback of address data will be performed again and the beam

spot will reach a target sector by revolution of a disk, record or playback of an information signal is performed after this sector.
[0123] Manufacture of the optical disk of this example is realizable by applying the approach indicated by JP,50-68413,A. The equipment which manufactures the optical disk of this example is briefly explained using drawing. Drawing 5 is the block diagram showing the configuration.
[0124] 60 is a source of a radiation beam like a laser light source, and emits the radiation beam 61 of sufficient energy. It converges the radiation beam 61 on the minute radiation beam spot with an objective lens 65 through the modulator 62 on the strength [optical], a light deflector 63, and the mirror prism 64. A photoresist layer is applied to the record carriers 66, such as an optical disk substrate, as a radiation beam sensing layer 67.
[0125] The modulator 62 on the strength [optical] intercepts the radiation beam 61 according to the recognition signal inputted through the amplifier 69 from the recognition signal generator 68. Therefore, the recognition signal outputted from the recognition signal generator 68 will be changed into a radiation beam pulse, and will be changed into the sensitization pit train on the radiation beam sensing layer 67. The recognition signal generator 68 generates a recognition signal, when the gate pulse from the gate signal generator 70 is inputted. The modulator 62 on the strength [optical] can consist of a photoelectrical crystal made to rotate the deflection direction of a radiation beam, and an analyzer which changes change of bearing of a deflection side into a change on the strength [optical], if an electrical potential difference is impressed.
[0126] Moreover, as for a light deflector 63, only while the gate pulse from the gate signal generator 70 connected through amplifier 71 was inputted, only a very small include angle changes the include angle of the radiation beam 61 so that the minute beam spot may displace only fixed width of face to the radial sense on a record carrier.
[0127] The gate signal generator 70 outputs a gate pulse equal to the die length of the recognition signal section to the recognition signal generator 68 and amplifier 71 with a predetermined period synchronizing with the revolution phasing signal outputted from the motor 72 made to rotate a record carrier 66. When a continuation truck is written in on the radiation beam sensing layer 67 and a gate pulse occurs by this while the gate pulse was not generated, a recognition signal is radially written in constant-rate gap ****** as a pit train to a previous continuation truck.
[0128] Thus, a continuation truck and the PURIPITTO train of a recognition signal can be written in on the radiation beam sensing layer 67 in a series of actuation. That is, a recognition signal is expressed with intermittence of a continuation truck. Moreover, the constant-rate increase of the reinforcement of the radiation beam 61 should be only then carried out like PURIPITTO of the synchronizing signal section 10 to form big PURIPITTO 8. After writing in, a disk substrate is completed through the phase of etching, an imprint, shaping, etc.
[0129] (Example 2) In addition, the sector mark block 81 of the broad bit of the wobble pit section 11 and the recognition signal section 12 without a gap G2 may be made to adjoin in the optical disk of this example shown in drawing 1 , although gaps G1 and G2 were formed before and after the wobble pit section 11, respectively instead of forming a gap G2, as shown in drawing 6 .
[0130] Since a sector mark is a fixed pattern, it is the same between adjoining trucks. Therefore, if the beam spot 9 shifts from a truck core, since the beam spot will come to start the next sector mark, there is little possibility of incorrect-detecting a sector mark. Moreover, by the time the beam spot 9 finishes passing the block of a sector mark, the synthetic circuit 33 will output a signal S3, and residual offset of tracking control can be canceled. If PURIPITTO of a sector mark is made into the broad pit 81 as shown in this drawing, detection of a sector mark will become still more certain.
[0131] In addition, the pattern for a synchronization, the address mark, and a sector number are also the same patterns in adjoining trucks among each block of the recognition signal section shown by drawing 3 . Therefore, detection can be ensured by making these into a broad pit.
[0132] (Example 3) A wobble pit may be prepared again immediately after the main information signal section which consists of a groove and a land. Drawing 7 is the example. 82 is the wobble pit section and two or more 4 sets of pairs which consist of the 1st wobble pit and the 2nd wobble pit are contained in this drawing. The first lot plays the role of the synchronizing signal section 10 of drawing 1 . Since two wobble pits are arranged in the medium with neighboring code tracks, respectively and require the one half of the beam spot for these wobble pits, it is detectable like PURIPITTO of the recognition signal section 12.
[0133] It becomes unnecessary to make PURIPITTO for synchronizing signals into a broad pit like drawing 1 by considering as a wobble pit. Therefore, production of a disk becomes comparatively easy.
[0134] Moreover, it may be made to detect the residuum of tracking control two or more times using two or more wobble pits. In this case, since the detection precision of residual offset improves, the beam spot can trace a truck core to accuracy further, and the stability of tracking control and the reading precision of a recognition signal increase.
[0135] moreover -- the optical disk of this example -- PURIPITTO of the recognition signal section 12 -- the center line of a land and a groove -- although exactly prepared in the medium, you may not necessarily be medium exactly.
[0136] At this time, the playback wave amplitudes of a recognition signal differ by the land and the groove. Also in which, waveform shaping becomes possible appropriately by changing the threshold of the data slice in the 2nd waveform shaping circuit between two level by the land and the groove.
[0137] For example, if a disk substrate is produced so that PURIPITTO may incline toward landau from medium, since the playback amplitude of the recognition signal in the code track of a land will become larger than a groove, it is desirable to make a threshold high.
[0138] In such an optical disk, since there is [PURIPITTO of the recognition signal section 12] less turbulence of a push pull signal than the case of a land and a groove where it is in the medium exactly, tracking control becomes stability.
[0139] Furthermore, although the wobble pit was prepared on the disk in the optical disk of this example in order to detect residual offset of tracking control, a groove may be made to move in a zigzag direction right and left.
[0140] (Example 4) Even if it uses the modulation component of the return light by meandering in case the beam spot scans the winding part, the amount of gaps of the beam spot and a code track is detectable. Hereafter, it explains using drawing.
[0141] Drawing 8 is the flat-surface enlarged drawing of the body of an optical disk which made the groove move in a zigzag direction. The section which ****** is the synchronizing signal section in 83 in this drawing, and was shown by 84 is the wobble groove section, and is making the groove both move in a zigzag direction.
[0142] The former is making the groove, as for the period of meandering, move in a zigzag direction right and left

instead of PURIPITTO of the synchronizing signal section 10 of drawing 1 , and the wobble pit section 11.
[0143] Since the amount of reflected lights serves as max when the core of the beam spot 9 is in agreement in the center of a groove, or the center of a land, residual offset of tracking control is detectable like a wobble pit by sampling and measuring the amount of reflected lights from the groove which moved in a zigzag direction right and left. And since a groove does not break off in the meantime, either, it is effective in there being no big fluctuation in the amount of reflected lights, and tracking control becoming stability further.
[0144] Since detection of a synchronizing signal is meandering to an one direction, it should just carry out the monitor of the push pull signal. Moreover, meandering in the wobble groove section may be repeated two or more times. The detection precision of residual offset improves by sampling two or more times.
[0145] In addition, the die length Wt which the groove of drawing 8 moved in a zigzag direction, and has shifted from the truck core is longer than the diameter of the beam spot, and its short thing is more desirable than the die length which can follow tracking control. It is because the beam spot moves in a zigzag direction along with a groove or a land if longer [if shorter than the former, the modulation factor of the amount of reflected lights will become small, and] than the latter, so a modulation factor becomes small too.
[0146] on the other hand -- the amplitude Wr of meandering of a groove in this drawing -- a groove pitch -- one fourth is [1/4 or less] desirably good.
[0147] Moreover, instead of detection of the synchronizing signal of the synchronizing signal section 83 performing timing detection which samples residual offset, a push pull signal may detect meandering of the groove in the wobble groove section 84, and the synchronous detection of the output of a summing amplifier 37 may be carried out. In this case, since the synchronizing signal section 83 becomes unnecessary, only that part can increase the main information signal section 13, and has the advantage that the capacity of an optical disk can be increased.
[0148] In addition, as an optical disk substrate, although there are glass, a polycarbonate, an acrylic, etc., an acrylic is desirable preferably. In JP,6-338064,A, as this invention person explained, when recording information on both the land of a rewritable mold record medium, and a groove, the thermal diffusion to an adjoining truck serves as a big technical problem. If the edge of a groove is made steep, since a record layer will sever in the part of an edge or will become extremely thin, thermal diffusion can be controlled. Imprint nature of an acrylic is good and it can make a groove with a steep edge.
[0149] Moreover, although the depth of PURIPITTO in the above example was explained as the same as that of the depth of a groove, it is good as for the different depth. If it is made especially lambda/4, since the diffraction effect of the beam spot will become large, there is outstanding effectiveness that modulation factors, such as a recognition signal, become high.
[0150] (Example 5) Drawing 11 is the amplification top view showing the body of the 5th example of the optical information record medium by this invention. it is shown in drawing 11 -- as -- a disk substrate top -- as a code track -- grooves 101, 103, 105, and 107 ... and lands 102, 104, 106, and 108 ... is formed by turns in the shape of a spiral. here -- grooves 101, 103, 105, and 107 ... and lands 102, 104, 106, and 108 -- the width of face of ... abbreviation -- it is set up so that it may become equal. When wavelength of a reading laser beam is set to lambda, they are grooves 101, 103, 105, and 107... The depth is set up by optical length between abbreviation lambda / 10, and abbreviation lambda / 4. Especially, they are grooves 101, 103, 105, and 107... If the depth is set up between abbreviation lambda / 7, and abbreviation lambda / 5, since the cross talk from an adjoining code track can be reduced, it is desirable (JP,5-282705,A).
[0151] The section shown in 111 is the recognition signal section. A groove is not formed in this recognition signal section 1111, but PURIPITTO 109 showing a recognition signal is formed every other truck between the center line 115 of a groove, and the center line 115 of a land. Here, the depth of PURIPITTO 109 is set up so that it may become equal to the difference of elevation of a groove and a land. Since a truck points out a land or a groove, a track pitch serves as a value of the one half of a groove pitch. A recognition signal is exactly the so-called recognition signal of optical disks, such as a truck and/or positional information of a sector, a sector mark, and a criteria synchronizing signal.
[0152] When the beam spot 110 passes the recognition signal section 111 by having formed PURIPITTO 109 showing a recognition signal every other truck between the center line 115 of a groove, and the center line 115 of a land, in order for a part of beam spot 110 to pass through a PURIPITTO 109 top, the amount of reflected lights is modulated by PURIPITTO 109 also in which of a land and a groove. Consequently, also in a land, a recognition signal is reproduced also in a groove.
[0153] The section shown in 112 is the field number section contained in the recognition signal section 111. Here, it shall express the field by putting the adjoining land and groove of a couple together, and one field number shall be given to the one field in an order from the inner circumference side of an optical disk, or a periphery side. In drawing 1 , a groove 101 and a land 102 are summarized, the field 116, a groove 103, and a land 104 are summarized, the field 117, a groove 105, and a land 106 are summarized, the field 118, a groove 107, and a land 108 are summarized, and it is considering as the field 119. That is, PURIPITTO 109 in the field number section 112 is formed on the borderline of the land belonging to the same field, and a groove.
[0154] The section shown in 113 is the track identity section contained in the recognition signal section 111. In the track identity section 113, at least one PURIPITTO 124 for track identities is formed in the medium of the PURIPITTO train in the field number section 112 every other field. That is, in the track identity section 113, PURIPITTO 124 for track identities is arranged on two borderlines of the field. By arranging PURIPITTO 124 for track identities in the track identity section 113, it can distinguish which the beam spot 110 shall trace between a land and a groove by the reflected light of the beam spot 110. The reason is explained to a detail later.
[0155] The section shown in 114 is the main information signal section. According to the information signal of an image, voice, or computer data, the record pit of an amorphous condition is formed in this main information signal section 114 like the conventional optical disk.
[0156] Next, the track format in the optical disk of this example is explained.
[0157] Drawing 12 is the block diagram of the code track in the optical disk of this example. As shown in drawing 12 , the groove 120 and the land 121 are formed by turns in the shape of a spiral. The field number is assigned to each truck for every round, and this field number increases every [1] from an inner circumference side toward a periphery side (field number: M-1, M, M+1, M+2). For example, from an inner circumference side, the beam spot is traced clockwise and goes to a periphery side. 122 is the sector which carried out N division of the 1 round of each truck, and the sector number is respectively given from No. 1 to No. N. In this example, since the groove 120 and the land

121 are formed in the shape of a spiral, the No. N sector of the No. M field and the No. 1 sector of the No. M+1 field are connected.
[0158] The above field number and sector number are formed in the recognition signal section 111 in drawing 11 as PURIPITTO 109 and 124. In corresponding to CAV control, each sector is arranged at a radial radial [of an optical disk]. In addition, two or more trucks are collectively made into one zone, the whole optical disk is divided into two or more zones, and it may be made to perform CAV control in each zone.
[0159] Drawing 13 is the format explanatory view of the recognition signal per 1 sector. As shown in drawing 13 , one sector consists of the recognition signal sections and the main information signal sections, and the recognition signal section is constituted by each block of a sector mark, the pattern for a synchronization, the address mark, a field number, a sector number, and the track identity section. The work of each block is as follows.
[0160] (1) Sector mark : it is shown that it is the head of each sector.
[0161] (2) The pattern for a synchronization : make the clock for address-data playback generate.
[0162] (3) Address mark : it is shown that address data start.
[0163] (4) A field number, a sector number : address data are shown.
[0164] (5) Track identity section : distinguish a land and a groove.
[0165] A sector mark, the pattern for a synchronization, and the address mark are [among these] the same with all sectors. Therefore, since the beam spot will start PURIPITTO of the same pattern of the next truck in these blocks even if the beam spot shifts from the core of a truck, there is little possibility of incorrect-detecting these signals. Moreover, if PURIPITTO is made into a broad pit, detection precision will improve further.
[0166] Below, it explains how it can distinguish which the beam spot shall trace between a land and a groove in the optical disk of this example shown in drawing 11 .
[0167] The enlarged drawing of the recognition signal section [in / in drawing 14 (a) / the optical disk of this example] and drawing 14 (b) are the wave form charts of the amount of reflected lights when the beam spot traces the recognition signal section. drawing 14 (a) -- setting -- 101, 103, 105, and 107 ... a groove, and 102, 104, 106 and 108 -- it is PURIPITTO for PURIPITTO to which in .. a land, and 116, 117, 118 and 119 express the field, and 109, 110, 112, 113, and 124 express a field number, respectively, the beam spot, the field number section, the track identity section, and track identities, and is the same as the thing of the jack per line shown in drawing 11 . Moreover, a and c are the center lines of grooves 1 and 3, and b and d are the center lines of lands 102 and 104. Sa, Sb, Sc, and Sd of drawing 14 (b) are the wave of the amount of reflected lights when the beam spot 110 traces a center line a, b, c, and d top in the direction of an arrow head.
[0168] In the field number section 112, since PURIPITTO 109 showing a field number is formed between the center line a and the center line b, Sa and Sb serve as the same wave. However, in the track identity section 113, since PURIPITTO 124 for track identities is formed only next to the center line b, a peak occurs only in Sb. That is, only in the truck of a land, the peak by PURIPITTO 124 for track identities occurs. Moreover, in the field number section 112, since PURIPITTO 109 showing a field number is formed between the center line c and the center line d, Sc and Sd serve as the same wave. However, in the track identity section 113, since PURIPITTO 124 for track identities is formed only next to the center line c, a peak occurs only in Sc. That is, only in the truck of a groove, the peak by PURIPITTO 124 for track identities occurs. Thus, even if it is the same field, the playback wave of the recognition signal section 111 (drawing 11) in two code tracks becomes a mutually different thing.
[0169] Furthermore, the direction where the peak by PURIPITTO 124 for track identities appears [in / on even number then an odd number field number and / for odd number and the field number of the field 117 / in the field number of the field 116 / the track identity section 113] serves as a land, and the direction where a peak does not appear serves as a groove. On the other hand in an even number field number, the direction where the peak by PURIPITTO 124 for track identities appears in the track identity section 113 serves as a groove, and the direction where a peak does not appear serves as a land. Since PURIPITTO 124 for track identities of the track identity section 113 is formed every other field, the thing same about all the fields can be said.
[0170] Therefore, it can distinguish whether the truck which the beam spot 110 is tracing is a land, or it is a groove identifying whether the number of the field numbers in the field number section 112 is even, or the number is odd, and by detecting the existence of the peak of the amount of reflected lights by PURIPITTO 124 for track identities in the track identity section 113.
[0171] Next, an information signal is recorded on the above-mentioned optical disk of this example, or the optical information record regenerative apparatus which reproduces or eliminates the recorded information signal is explained.

[0172] Drawing 15 is the block diagram showing the configuration of one example of the optical information record regenerative apparatus concerning this invention.
[0173] The optical disk 131 of drawing 15 has said structure, and is equipped with the code track 132 formed from the land and the groove. According to this optical information record and regenerative apparatus, to an optical disk 131, information can be recorded or it can reproduce.
[0174] First, the configuration of the optical head 139 is explained. The optical head 139 is equipped with the semiconductor laser component 133, the collimate lens 134 with which semiconductor laser 133 makes parallel light the laser beam by which outgoing radiation was carried out, the half mirror 135, the objective lens 136 which makes the information side of an optical disk 131 condense the parallel light which passed the half mirror 135, the photodetector 137 which receives the reflected light from an optical disk 131 which passed through the objective lens 136 and the half mirror 135, and the actuator 138 which supports an objective lens 136. The photodetector 137 has two light sensing portions 137a and 137b made parallel 2 ****s with the direction of a truck of a disk in order to generate a tracking-error signal. These components are attached in the head base which is not illustrated.
[0175] The output (detecting signal outputted from the light sensing portions 137a and 137b of a photodetector 137) from an optical pickup 139 is inputted into the differential amplifier 140 and a summing amplifier 146. The output of the differential amplifier 140 is inputted into a low pass filter (LPF) 141.
[0176] LPF141 outputs the difference signal which the differential amplifier 140 outputs to the polarity-reversals circuit 142 as reception and a signal S1. The polarity-reversals circuit 142 outputs a signal for the signal which LPF141 outputs, and the control signal L4 from the system controller 162 mentioned later to reception and the tracking control circuit 143.
[0177] On the other hand, the output (sum signal) of a summing amplifier 146 is inputted into a high-pass filter (HPF) 147. HPF147 outputs the high frequency component of a sum signal to the 1st waveform shaping circuit 148, the 2nd

corrugating circuit 151, and the identifier detector 153.
[0178] The 1st waveform shaping circuit 148 outputs the high frequency component of a sum signal to the regenerative-signal processing circuit 149 which mentions reception and a digital signal later from HPF147. The regenerative-signal processing circuit 149 outputs the reproduced information signal to an output terminal 150. The 2nd waveform shaping circuit 151 outputs the high frequency component of a sum signal to the address regenerative circuit 152 which mentions reception and a digital signal later from HPF147. The address regenerative circuit 152 outputs a digital signal to the address calculation circuit 154 which mentions reception and the 1st address data later from the 2nd waveform shaping circuit 151.
[0179] the identifier detector 153 outputs the high frequency component of the sum signal outputted from HPF147 to reception, and outputs an identifier detecting signal to the address calculation circuit 154 -- it comes out. The address calculation circuit 154 inputs the 1st address data outputted from the address regenerative circuit 152, and the identifier detecting signal outputted from the identifier detector 153, and outputs the 2nd address data to a system controller 162.
[0180] The tracking control circuit 143 outputs a tracking control signal for the output signal of the polarity-reversals circuit 142, and the control signal L1 from a system controller 162 to one of two input terminals, reception and the 1st selector 144. The 1st selector 144 outputs a driving signal for a control signal L5 to reception, the actuation circuit 145, and the traverse control circuit 156 from the jump pulse generating circuit 155 to the tracking control circuit 143 to a tracking control signal, a driving pulse, and a system controller 162.
[0181] A driving signal is inputted from the 1st selector 144, and the actuation circuit 145 outputs an actuation current to an actuator 138.
[0182] Since it differs, the amplification factor of the 1st waveform shaping circuit 148 and the 2nd waveform shaping circuit 151 has been changed with the playback amplitude of the main information signal by the record mark, and the recognition signal by PURIPITTO.
[0183] The jump pulse generating circuit 155 outputs control signal L6 to reception from a system controller 162, and outputs a driving pulse to the 1st selector 144.
[0184] The traverse control circuit 156 outputs an actuation current for the 1st selector 144 to a system controller 162 to the control signal L2, and a tracking control signal to reception and the traverse motor 157.
[0185] The traverse motor 157 is a motor made to move the optical head 139 to radial [of an optical disk 131]. Moreover, a spindle motor 158 is a motor made to rotate an optical disk 131.
[0186] The record digital disposal circuit 159 outputs a system controller 162 to information signals, such as the external input terminal 160 to image voice, and the control signal L3 to the laser actuation circuit 161 which mentions reception and a record signal later. The laser actuation circuit 161 outputs [system controller / 162] an actuation current for a record signal to reception and semiconductor laser 133 from a control signal L3 and the record digital disposal circuit 159.
[0187] A system controller 162 outputs a control signal L1 - L6 for the 2nd address data to reception, the tracking control circuit 143, the traverse control circuit 156, the record digital disposal circuit 159, the laser actuation circuit 161, the polarity-reversals circuit 142, the 1st selector 144, and the jump pulse generating circuit 155 from the address calculation circuit 154.
[0188] Hereafter, actuation of the optical information record and the regenerative apparatus constituted as mentioned above is explained.
[0189] First, the actuation when reproducing an information signal is explained. The laser actuation circuit 161 serves as a playback mode in response to the control signal L3 outputted from a system controller 162, outputs an actuation current to semiconductor laser 133, and is made to emit light by fixed reinforcement. On the other hand, according to the control signal L2 outputted from a system controller 162, the traverse control circuit 156 outputs an actuation current to the traverse motor 157, and moves the optical head 139 to a target truck.
[0190] The laser beam emitted from semiconductor laser 133 is changed into parallel light by the collimate lens 134, and is condensed on an optical disk 131 with an objective lens 136 via a beam splitter 135.
[0191] The light beam reflected with the optical disk 131 is led to a photodetector 137 by the beam splitter 135 via an objective lens 136, after the information on a code track 132 is given by diffraction (distribution of the amount of reflected lights).
[0192] The light sensing portions 137a and 137b of a photodetector 137 change into an electrical signal quantity of light change of a light beam which carried out incidence, and output it to the differential amplifier 140 and a summing amplifier 147, respectively. After the differential amplifier 140 changes each input current into an electrical potential difference, it takes differential and outputs it to LPF141 as a difference signal.
[0193] LPF141 extracts a low-frequency component from this difference signal, and outputs it to the polarity-reversals circuit 142 as a signal S1. According to the control signal L4 inputted from a system controller 162, the polarity-reversals circuit 142 passes a signal S1 as it is, or reverses the polarity of the positive/negative of a signal S1, and is outputted to the tracking control circuit 143 as a signal S2. A signal S2 is the so-called push pull signal, and supports the amount of tracking errors between the beam spots and the code tracks 132 which were condensed by the information side of an optical disk 131.
[0194] Here, when a truck to make pass a signal S1 as it is, and record or reproduce when a truck to record or reproduce is a groove is a land, the polarity of the positive/negative of a signal S1 shall be reversed.
[0195] The tracking control circuit 143 outputs a tracking control signal to the actuation circuit 145 through a selector 144 according to the level of the inputted signal S2. According to this tracking control signal, the actuation circuit 145 outputs an actuation current to an actuator 138, and moves the location of an objective lens 136 in the direction which crosses a code track 132. Thereby, the beam spot can scan correctly the code-track 132 top of an optical disk 131.
[0196] An optical disk 131 moves the optical head 139 gradually radially as the traverse control circuit 156 inputs the tracking control signal outputted from the tracking control circuit 143, drives the traverse motor 57 according to the low-pass component and continues playback.
[0197] A selector 144 connects the input side of the actuation circuit 145, and the output side of the jump pulse generating circuit 155 according to the control signal L5 outputted from a system controller 162. When moving the beam spot between code tracks (i.e., only when carrying out the track jump of the selector 144), it connects the input side of the actuation circuit 145 to the output side of the jump pulse generating circuit 155. In not carrying out a track jump, a selector 144 connects the input side of the actuation circuit 145 to the output side of the tracking control

circuit 143.
[0198] Position control of the objective lens 136 is carried out in the direction of an optical axis by the focal control circuit which is not illustrated so that the beam spot may connect a focus correctly on an optical disk 131 on the other hand.
[0199] If the beam spot is correctly positioned on the code track 132 of an optical disk 131, after transforming into an electrical potential difference the current outputted from the light sensing portions 137a and 137b of a photodetector 137, a summing amplifier 146 will be added and will be outputted to HPF147 as a sum signal.
[0200] HPF147 cuts an unnecessary low-frequency component from a sum signal, passes the main information signal and recognition signal which are a regenerative signal with an analog wave, and is outputted to the 1st waveform shaping circuit 148, 2nd waveform shaping circuit 151, and identifier detector 153.
[0201] With the 2nd threshold, a data slice is carried out, the recognition signal of an analog wave is used as pulse shape, and the 2nd waveform shaping circuit 151 outputs it to the address regenerative circuit 152.
[0202] The address regenerative circuit 152 restores to the inputted digital recognition signal, and outputs a field number and a sector number to the address calculation circuit 154 as the 1st address data.
[0203] When the beam spot passes the track identity section on an optical disk 131, the identifier detector 153 outputs to the address calculation circuit 154 as an identifier detecting signal on digital binary level, as a result of detecting and detecting the existence of the peak of a playback wave by PURIPITTO for track identities. Here, when PURIPITTO for track identities is detected, an output serves as high (Hi) level, and it shall be set to low (Lo) level when PURIPITTO is not detected. A level comparator, a peak detector, etc. can perform detection of PURIPITTO for track identities like detection of other PURIPITTO. In the format configuration shown in drawing 13 , after reading a sector number, since the track identity section is located after a sector number, if the monitor of whether the peak by PURIPITTO for track identities exists in a regenerative signal is carried out, PURIPITTO for track identities is detectable [a predetermined time interval is placed, and].
[0204] Drawing 16 is the block diagram showing the detailed configuration of an identifier detector, and gives the same number to the same thing as the component shown in drawing 15 . Moreover, drawing 17 is the timing chart of the signals from T1 to T5. As shown in drawing 16 , the detection aperture generation circuit 170 inputs the timing pulse T1 which tells having started the read of the recognition signal section from the address regenerative circuit 152, and outputs the detection aperture signal T2 which places the predetermined time delay alpha and has Hi level section of the fixed detection width of window beta to AND gate 172. The trace rate of the beam spot, revolution fluctuation of a spindle motor, etc. are taken into consideration, and, as for a time delay alpha and the detection width of window beta, the beam spot is determined only for the detection pulse of PURIPITTO for track identities so that it may be settled within Hi level section of the detection aperture signal T2. Moreover, a timing pulse T1 is outputted from the address regenerative circuit 152, when the address regenerative circuit 152 detects the address mark. On the other hand, after the 3rd waveform shaping circuit 171 carries out the data slice of the regenerative signal of an analog wave with the 3rd threshold from HPF147, it is outputted to AND gate 172 as digital pulse T3. In drawing 14 , when the beam spot 110 traces a truck core top, the 3rd threshold is set as one half extent of peak voltage so that detection of the signal Sa produced by PURIPITTO 124 of the track identity section 113 or the peak of Sb may sufficiently be attained. And AND gate 172 is with the detection aperture signal T2 and digital pulse T3, it calculates and it is outputted to a latch circuit 173 by making the result into digital signal T four. Once digital signal T four is set to Hi level, a latch circuit 173 will be in the condition which held the level as it was, and will be outputted to the address calculation circuit 154 as an identifier detecting signal T5. The maintenance condition of the input signal level in a latch circuit 173 is reset by the means of a timer etc., after sufficient time amount to compute the 2nd address data in the address calculation circuit 154 passes.
[0205] In addition, although generating of the timing pulse T1 in the address regenerative circuit 152 is made to be performed on the basis of the timing which detected the address mark, it is good on the basis of the timing which the sector mark, the field number, and the sector number detected.
[0206] An example of the distinction algorithm of the land in the address calculation circuit 154 and a groove is shown in drawing 18 . In step 1, it judges whether the number of the field numbers in the 1st address data is even, or the number is odd. If the number of field numbers is even, it will move to step 2, and if the number of field numbers is odd, it will move to step 4. In step 2, it judges whether the identifier detecting signal T5 is Hi level or it is Lo level. If the identifier detecting signal T5 is Hi level, it will move to step 3, and if the identifier detecting signal T5 is Lo level, it will move to step 5. Moreover, also in step 4, it judges whether the identifier detecting signal T5 is Hi level or it is Lo level. And if the identifier detecting signal T5 is Hi level, it will move to step 5, and if the identifier detecting signal T5 is Lo level, it will move to step 3. In step 3, it judges that the truck under trace is a groove, and judges that the truck under trace is a land in step 5, and the 2nd address data are determined, respectively.
[0207] It returns to drawing 15 and explanation is continued. The address calculation circuit 154 distinguishes whether the truck the beam spot is carrying out [the truck] the current scan is a land, or it is a groove with the output level of the identifier detecting signal T5, and the parity of the field number of the 1st address data. And the distinguished result, and a field number and a sector number are outputted to a system controller 162 as the 2nd address data.
[0208] It judges whether a system controller 162 has the beam spot to the address of a current request based on these 2nd address data. If the beam spot is in the desired address, a control signal L4 and L5 grade will be maintained as it is, and the beam spot will be made to trace the main information signal section succeedingly. While the beam spot is tracing the main information signal section, after the 1st waveform shaping circuit 148 carries out the data slice of the main information signal of an analog wave inputted via a photodetector 137, a summing amplifier 146, and HPF147 with the 1st threshold, it is outputted to the regenerative-signal processing circuit 49 as a digital signal.
[0209] The regenerative-signal processing circuit 149 restores to the inputted main information signal, processes an error correction etc. henceforth, and outputs it to an output terminal 150 as an image sound signal or computer data.
[0210] A system controller 162 outputs a control signal L3 at the time of record, and the record digital disposal circuit 159 and the laser actuation circuit 161 are told about being a recording mode. The record digital disposal circuit 159 adds an error correcting code etc. to an image sound signal or computer data inputted from the external input terminal 160, and outputs it to the laser actuation circuit 161 as an encoded record signal. If set as a recording mode by the control signal L3, the laser actuation circuit 161 will modulate the actuation current impressed to semiconductor laser 33 according to a record signal. The beam spot irradiated on an optical disk 131 carries out on-the-strength change by this according to a record signal, and a record pit is formed on an optical disk 131.
[0211] On the other hand, the laser actuation circuit 161 is set as a playback mode by the control signal L3 at the

time of playback. And the laser actuation circuit 161 controls an actuation current so that semiconductor laser 133 emits light by fixed reinforcement weaker than the time of a recording mode.
[0212] While each above actuation is performed, a spindle motor 158 rotates an optical disk 131 with a fixed angular velocity.
[0213] Next, the actuation (henceforth "seeking") for which the beam spot is moved to the target address is further explained to a detail. If the address which starts record/playback is specified, a system controller 162 will output a control signal L4 by whether the specified address is a land or it is a groove.
[0214] Here, when the specified address is a groove, a control signal L4 serves as Lo level, and when the specified address is a land, it is assumed that a control signal L4 is set to Hi level. In this example, since the push pull method is adopted as a tracking-error detecting method, the polarity of the tracking-error signal detected by the land and the groove becomes reverse. For this reason, when a starting address is a land, the polarity-reversals circuit 142 carries out the polarity reversals of the input signal, and when a starting address is a groove, it outputs, without changing a polarity. Moreover, a system controller 162 makes the tracking control circuit 143 choose it as a selector 144 as an input place of the actuation circuit 145 with a control signal L5. The tracking control circuit 143 is in the condition of not outputting a tracking control signal with a control signal L1, at this time.
[0215] A system controller 162 outputs a control signal L2 to the traverse control circuit 156, the traverse motor 157 is made to drive, and coarse seeking is performed. This migration calculates the truck number between both beforehand from the difference of the address value for example, before migration, and a target address value, and is performed by comparing with the crossing truck number obtained from a tracking-error signal during migration.
[0216] A system controller 162 outputs a control signal L1 to the tracking control circuit 143, makes it go via a selector 144, outputs a tracking control signal to the actuation circuit 145 and the traverse control circuit 156, and makes the beam spot trace on a land or a groove. Completion of tracking drawing in performs playback of the address data from the recognition signal section. That is, the 1st address data are inputted into the address calculation circuit 154 through a photodetector 137, a summing amplifier 146, HPF147, the 2nd waveform shaping circuit 151, and the address regenerative circuit 152.
[0217] With the 1st inputted address data and the output level of the identifier detecting signal outputted from the identifier detector 153, the address calculation circuit 154 computes the 2nd address data, and outputs them to a system controller 162.
[0218] When the 2nd address data and target address value are compared and both field number is not in agreement, a system controller 162 outputs a control signal L5 to a selector 144, and connects the output side of the jump pulse generating circuit 155, and the input side of the actuation circuit 45. Moreover, a system controller 162 is changed into the condition of outputting a control signal L2 to the traverse control circuit 156, and not outputting a driving signal to the traverse motor 157. And a system controller 162 outputs signal L6 to the jump pulse generating circuit 156, and the jump pulse generating circuit 156 which inputted signal L6 outputs the driving pulse of the number corresponding to a field number difference to the actuation circuit 145.
[0219] The actuation circuit 145 outputs the actuation current corresponding to a driving pulse to an actuator 138, and only the specified number carries out [actuator / 138] the track jump of the beam spot. here -- a track jump -- the groove of a groove to a next door -- or it means that the beam spot moves to the next land from a land. If the track jump of the specified number is completed, tracking drawing in will be performed and playback of address data will be performed again. And after the beam spot reaches a target sector by revolution of an optical disk 131, record or playback of an information signal is performed after this sector.
[0220] In addition, in this example, although one PURIPITTO for track identities is formed, more than one may be formed. If two or more PURIPITTO for track identities is formed, the probability of incorrect detection of a track identity will decrease and the dependability of detection will improve.
[0221] Moreover, when two or more PURIPITTO for track identities is formed, the possibility of incorrect detection of a track identity can be further reduced by what it seems for that the pattern shall not be appeared in other signals of the recognition signal section.
[0222] (Example 6) Drawing 19 is the amplification top view showing the body of the optical disk in the 6th example of this invention. In drawing 19 , a land, and 109, 110, 111, 112, 113 and 114 are PURIPITTO, the beam spot, the recognition signal section, the field number section, the track identity section, and the main information signal section, respectively, and a groove, and 102, 104, 106 and 108 of 101, 103, 105, and 107 are the same as that of the thing of the jack per line shown in drawing 11 of the 5th example of the above. 180 is PURIPITTO for track identities and has become the same arrangement as PURIPITTO 124 for track identities in the track identity section 113 shown in drawing 11 . The field where a groove and 182 consist of a land 102 and a groove 103 in 181, the field where 183 consists of a land 104 and a groove 105, the field where 184 consists of a land 106 and a groove 107, and 185 are the fields which consist of a land 108 and a groove 181. Only as for the one half of a groove pitch, in this example, PURIPITTO 109 in the recognition signal section 111 has shifted to radial [of an optical disk] altogether. Other configurations are the same as the configuration shown in drawing 11 . Also in this example, a land and a groove can be distinguished by the parity of a field number, and the existence of PURIPITTO 180 for track identities.
[0223] (Example 7) Drawing 20 is the amplification top view showing the body of the optical disk in the 7th example of this invention. In drawing 20 , a groove, and 102, 104, 106 and 108 of 101, 103, 105, and 107 are the same as that of the thing of the jack per line with which a land, and 109, 110, 111, 112, 113 and 114 are the fields, respectively, and it indicated PURIPITTO, the beam spot, the recognition signal section, the field number section, the track identity section and the main information signal section, and 116, 117, 118 and 119 to be to drawing 11 of the 5th example of the above. 190 is PURIPITTO for track identities and has become the same arrangement as PURIPITTO for track identities in the track identity section 113 shown in drawing 11 . Moreover, 191 is PURIPITTO for timing generation and is formed the same period as a groove pitch on the same straight line as PURIPITTO 109 of the field number section 112. As for PURIPITTO 191 for timing generation, only distance gamma is ahead arranged rather than PURIPITTO 190 for track identities. Since it is formed on the same straight line as PURIPITTO 109 of the field number section, this PURIPITTO 191 for timing generation is detectable also in a land also in a groove. For this reason, it can use as a timing pulse T1 which described the detecting signal of this PURIPITTO 191 for timing generation in the 5th example of the above.
[0224] (Example 8) Drawing 21 is the amplification top view showing the body of the optical disk in the 8th example of this invention. In drawing 21 , a groove, and 102, 104, 106 and 108 of 101, 103, 105, and 107 are the same as that of the thing of the jack per line with which a land, and 109, 110, 111, 112, 113 and 114 are the fields, respectively, and

they indicated PURIPITTO, the beam spot, the recognition signal section, the field number section, the track identity section and the main information signal section, and 116, 117, 118 and 119 to be to drawing 11 . 200 is the 1st PURIPITTO for track identities, and one PURIPITTO is formed in the medium of the PURIPITTO train in the field number section 112 every other field. 201 is the 2nd PURIPITTO for track identities, and is behind 1st PURIPITTO 200 for track identities, and is formed every other field 1st PURIPITTO 200 for track identities, and by turns [two].
[0225] The beam spot of the enlarged drawing of the identification number section [in / in drawing 22 (a) / the optical disk of this example] and drawing 22 (b) is the wave form chart of the amount of reflected lights when tracing the identification number section. a and c are the center lines of grooves 1 and 3 among drawing 22 (a), and b and d are the center lines of lands 2 and 4. Sa, Sb, Sc, and Sd of drawing 22 (b) are the wave of the amount of reflected lights when the beam spot 110 traces center line a, b, and c and d top in the direction of an arrow head.
[0226] Since PURIPITTO 109 showing a field number is formed between the center line a and the center line b, Sa and Sb serve as the same wave in the field number section 112. However, in the track identity section 113, since 2nd two PURIPITTO 201 for track identities is formed next to the center line a and 1st PURIPITTO 200 for track identities is formed next to the center line b, the number of the peak in the track identity section 113 becomes two pieces by Sa, and becomes one piece by Sb. Moreover, since 1st PURIPITTO 200 for track identities is formed next to a center line c and 2nd two PURIPITTO 201 for track identities is formed next to the center line d, the number of the peak in the track identity section 113 becomes one piece by Sc, and becomes two pieces by Sd.
[0227] Furthermore, like the case of the above-mentioned example, the field number of the field 116 can be distinguished as the direction where one peak by PURIPITTO appears [in / on even number then an odd number field number and / for odd number and the field number of the field 117 / the track identity section 113] is a land and the direction where two peaks appear is a groove. On the other hand, in an even number field number, the direction where one peak by PURIPITTO appears in the track identity section 113 is a groove, and the direction which appears two pieces can distinguish after ** on a land.
[0228] Therefore, it can distinguish whether the truck which the beam spot 110 is tracing is a land, or it is a groove identifying whether the number of the field numbers in the field number section 112 is even, or the number is odd, and by detecting the number of the peak of change of the amount of reflected lights by PURIPITTO in the track identity section 113.
[0229] Moreover, in this example, since it is not concerned with whether it is the parity and land of a field number, or it is a groove but the peak by 1st and 2nd PURIPITTO 200 and 201 for track identities exists, there is no incorrect detection and a land and a groove can be distinguished to accuracy.
[0230] in addition, the optical disk of the above 5th - the 8th example -- setting -- PURIPITTO of the recognition signal section 111 -- the center line of a land and a groove -- although exactly prepared in the medium, it is not necessary to necessarily prepare in the medium exactly In [of the center line of a land and a groove] not preparing in the medium exactly, the playback wave amplitudes of a recognition signal differ PURIPITTO of the recognition signal section 111 by the land and the groove. It becomes possible by changing the threshold of the data slice in the 2nd waveform shaping circuit 151 between two level by the land and the groove to shape in waveform appropriately also in which. For example, since the playback amplitude of the recognition signal in the code track of a land becomes larger than a land when a disk substrate is produced so that PURIPITTO may incline toward landau rather than the medium of the center line of a land and a groove, it is desirable to make a threshold high. In such an optical disk, since there is [PURIPITTO of the recognition signal section 111] less turbulence of a push pull signal than the case of a land and a groove where it is in the medium exactly, tracking control is stabilized.
[0231] Moreover, as an optical disk substrate, although there are glass, a polycarbonate, an acrylic, etc., an acrylic is desirable especially. In recording information on the land of a record medium and the both sides of a groove which can rewrite, the thermal diffusion to an adjoining truck poses a big problem (JP,6-338064,A). If the edge of a groove is made steep, since a record layer will sever in the part of an edge or will become extremely thin, thermal diffusion can be controlled. Imprint nature of an acrylic is good and it can make a groove with a steep edge.
[0232] Moreover, in the above 5th - the 8th example, although the case where the depth of PURIPITTO was the same as the depth of a groove was mentioned as the example and explained, it is good as for the different depth. If the depth of PURIPITTO is especially made into lambda/4, since the diffraction effect of the beam spot will become large, modulation factors, such as a recognition signal, become high.
[0233] Moreover, in the above 5th - the 8th example, although the land of a lot and the recording track of a groove were packed into the recognition signal section and the field number was given, a track number may be given as the serial number, without distinguishing a land and a groove. Since the number of the recognition signal sections is one to two trucks, the track number which can be formed in the recognition signal section as PURIPITTO serves as only odd number or even number. In this case, according to the distinction result of a land and a groove by the track identity section, 1 is added to the track number which PURIPITTO was reproduced at the time of a groove and obtained, and at the time of a land, if 1 is not added to the track number which reproduced PURIPITTO and was obtained, it is good.
[0234] Moreover, in the optical disk of the above 5th - the 8th example, although the both sides of a groove and a land were used as the code track, and the adjacent groove and adjacent land of a lot were defined as one information field and explained, if it is the optical disk of a configuration so that it may become half [where the track pitch of the main information signal section consists of PURIPITTO / of the track pitch of the recognition signal section], it is not this limitation. For example, the above 5th - the 8th example are applicable also to the magneto-optic disk using the magnetic super resolution effectiveness.
[0235] According to this invention, the recording density of an optical disk can be raised as mentioned above. For example, it becomes possible to record about the same image information as a laser disk on the disk of about the same magnitude as a compact disk (CD), and an optical information record regenerative apparatus can be miniaturized. For example, if the optical information record regenerative apparatus of the above-mentioned example is used in recent years instead of the regenerative apparatus of CD-ROM which has spread with the personal computer, it will become possible to carry out record playback of the high-definition image data which need big storage capacity at the optical disk of the above 1st - the 8th example, and the portability of mass information will improve.
[0236] In addition, typically, the size of each part of an optical disk of the 1-8th examples of the above is as follows.
[0237] groove pitch: 1.48-micrometer track pitch: 0.74-micrometer groove depth: About 60-80nm pit depth: About 60-80nm groove width-of-face (land width): Width of face of PURIPITTO of 0.6-0.7-micrometer recognition signal section: Minimum value of the die length of PURIPITTO of 0.5-0.7-micrometer recognition signal section: Wavelength of about 0.6-micrometer laser beam: NA of 650nm objective lens (numerical aperture) : The thing which is 0.6 and for

which this invention is not limited to these numeric values cannot be overemphasized.
[0238]
[Effect of the Invention] Since residual offset of tracking control is canceled by the wobble pit of a servo field before the beam spot arrives at the recognition signal field which consists of PURIPITTO which shifted the optical information record medium and optical information record regenerative apparatus of this invention from the center line of a land or a groove, and has been arranged, the beam spot traces a truck core to accuracy. Therefore, detection of a recognition signal is performed good.
[0239] Moreover, according to this invention, it can distinguish which [of the two code tracks] the light beam is scanning by detecting the field number and truck identifier which were formed as PURIPITTO on the disk substrate. Consequently, also in the optical information record medium which has the code track of a track pitch narrower than the track pitch limitation of PURIPITTO, since positional information is acquired by accuracy, large capacity-ization of an optical information record medium is attained.

[Translation done.]

DESCRIPTION OF DRAWINGS

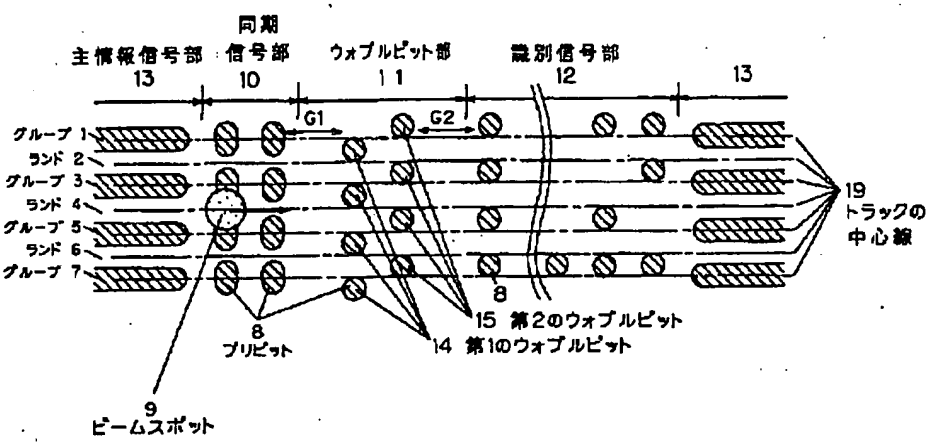
[Brief Description of the Drawings]
[Drawing 1] The flat-surface enlarged drawing of the body of the optical disk in the example of this invention
[Drawing 2] Drawing showing the configuration of the code track of the optical disk in this example
[Drawing 3] Drawing for explaining the sector format of the optical disk in this example
[Drawing 4] The block diagram showing the configuration of the optical information record and the regenerative apparatus of this example
[Drawing 5] The block diagram showing the configuration for the body of the manufacturing installation of the optical disk in this example
[Drawing 6] The flat-surface enlarged drawing of the body of the optical disk in other examples of this invention
[Drawing 7] The flat-surface enlarged drawing of the body of the optical disk in other examples of this invention
[Drawing 8] The flat-surface enlarged drawing of the body of the optical disk in other examples of this invention
[Drawing 9] The amplification perspective view of the conventional optical disk
[Drawing 10] The amplification perspective view of the optical disk which records a signal on both the conventional land and a groove
[Drawing 11] It is the amplification top view showing the body of the optical disk in the 5th example of this invention.
[Drawing 12] It is the block diagram showing the code track of the optical disk in the 5th example of this invention.
[Drawing 13] It is drawing for explaining the sector format of the optical disk in the 5th example of this invention.
[Drawing 14] The flat-surface enlarged drawing of the recognition signal section of an optical disk [in / in (a) / the 5th example of this invention] and (b) are the wave form charts of the regenerative signal of the reflected light of the beam spot.
[Drawing 15] It is the block diagram showing the configuration of the optical information record regenerative apparatus in the 5th example of this invention.
[Drawing 16] It is the block diagram showing the detailed configuration of the identifier detector in the 5th example of this invention.
[Drawing 17] It is timing-chart drawing of the various signals in the identifier detector in the 5th example of this invention.
[Drawing 18] It is the flow chart which shows the distinction algorithm of the land/groove in the 5th example of this invention.
[Drawing 19] It is the amplification top view showing the body of the optical disk in the 6th example of this invention.
[Drawing 20] It is the amplification top view showing the body of the optical disk in the 7th example of this invention.
[Drawing 21] It is the amplification top view showing the body of the optical disk in the 8th example of this invention.
[Drawing 22] The amplification top view showing the recognition signal section of an optical disk [in / in (a) / the 8th example of this invention] and (b) are the wave form charts of the regenerative signal of the reflected light of the beam spot.
[Description of Notations]
1, 3, 5, 7, 16 Groove
2, 4, 6, 17 Land
8 PURIPITTO
10,100 Synchronizing signal section
11, 80, 90 Wobble pit section
12 Recognition Signal Section
13 The Main Information Signal Section
14 1st Wobble Pit
15 2nd Wobble Pit
18 Sector
21 Optical Disk
22 Code Track
23 Semiconductor Laser
24 Collimator Lens
25 Beam Splitter
26 Objective Lens
27 Photodetector
27a, 27b Light sensing portion
28 Actuator
29 Optical Head
30 Differential Amplifier
33 Synthetic Circuit
34 Tracking Control Circuit
36 Actuation Circuit
37 Summing Amplifier
39 1st Waveform Shaping Circuit
40 Regenerative-Signal Processing Circuit
42 2nd Waveform Shaping Circuit

43 Address Regenerative Circuit
44 Address Calculation Circuit
45 Synchronizing Signal Detector
46 Timing Generating Circuit
47 Sample Hold Circuit
48 Amendment Signal Generation Means
52 Spindle Motor
53 Record Digital Disposal Circuit
55 LD Actuation Circuit
56 System Controller

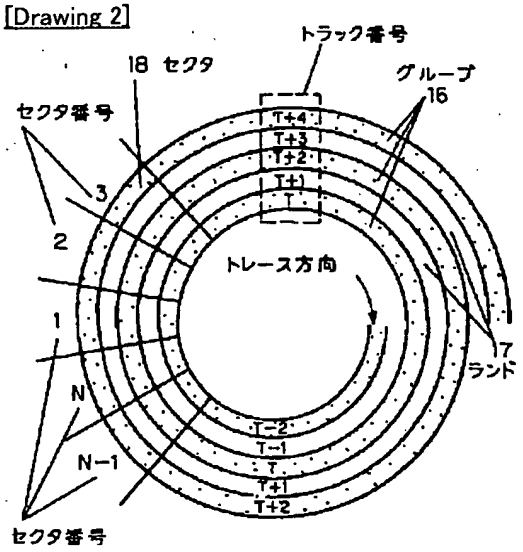
[Translation done.]

DRAWINGS

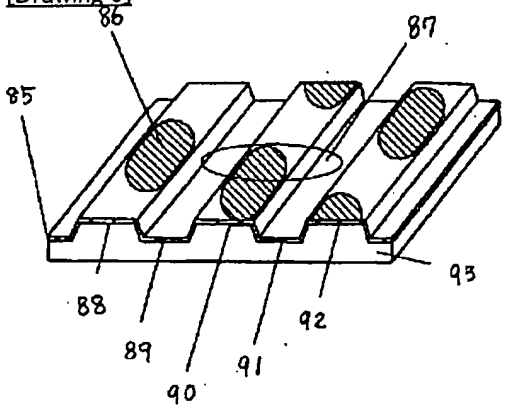
[Drawing 1]



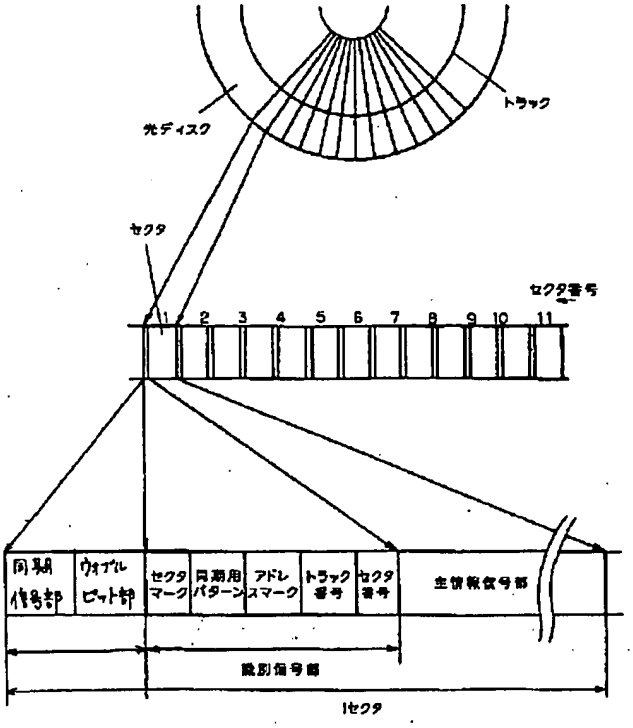
[Drawing 2]



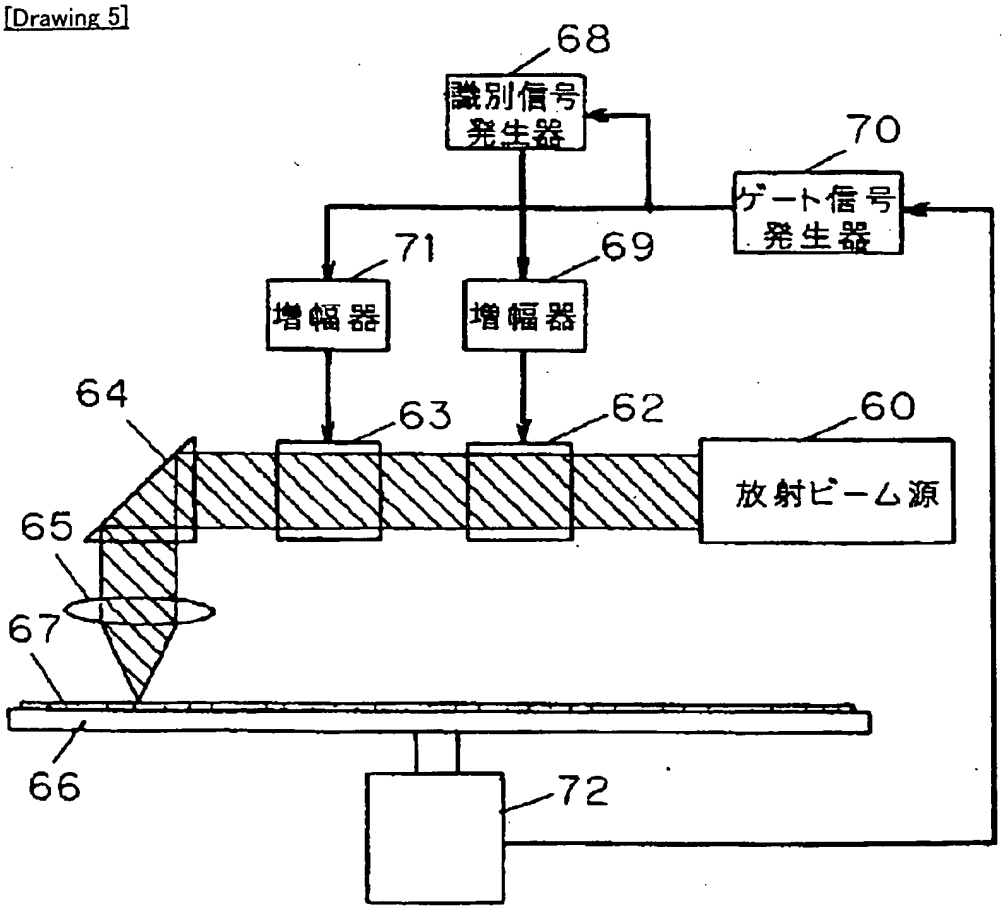
[Drawing 9]



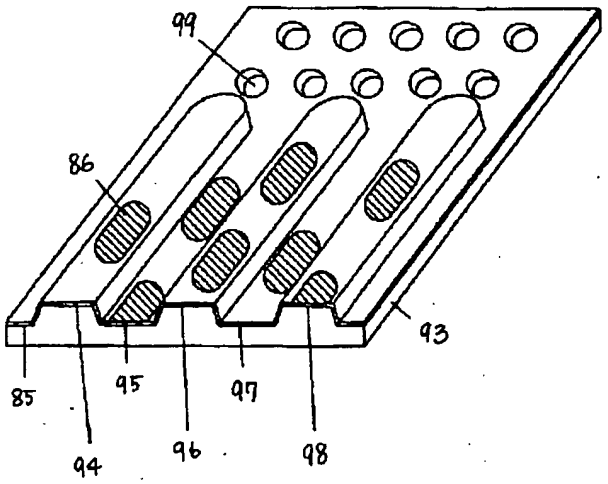
[Drawing 3]



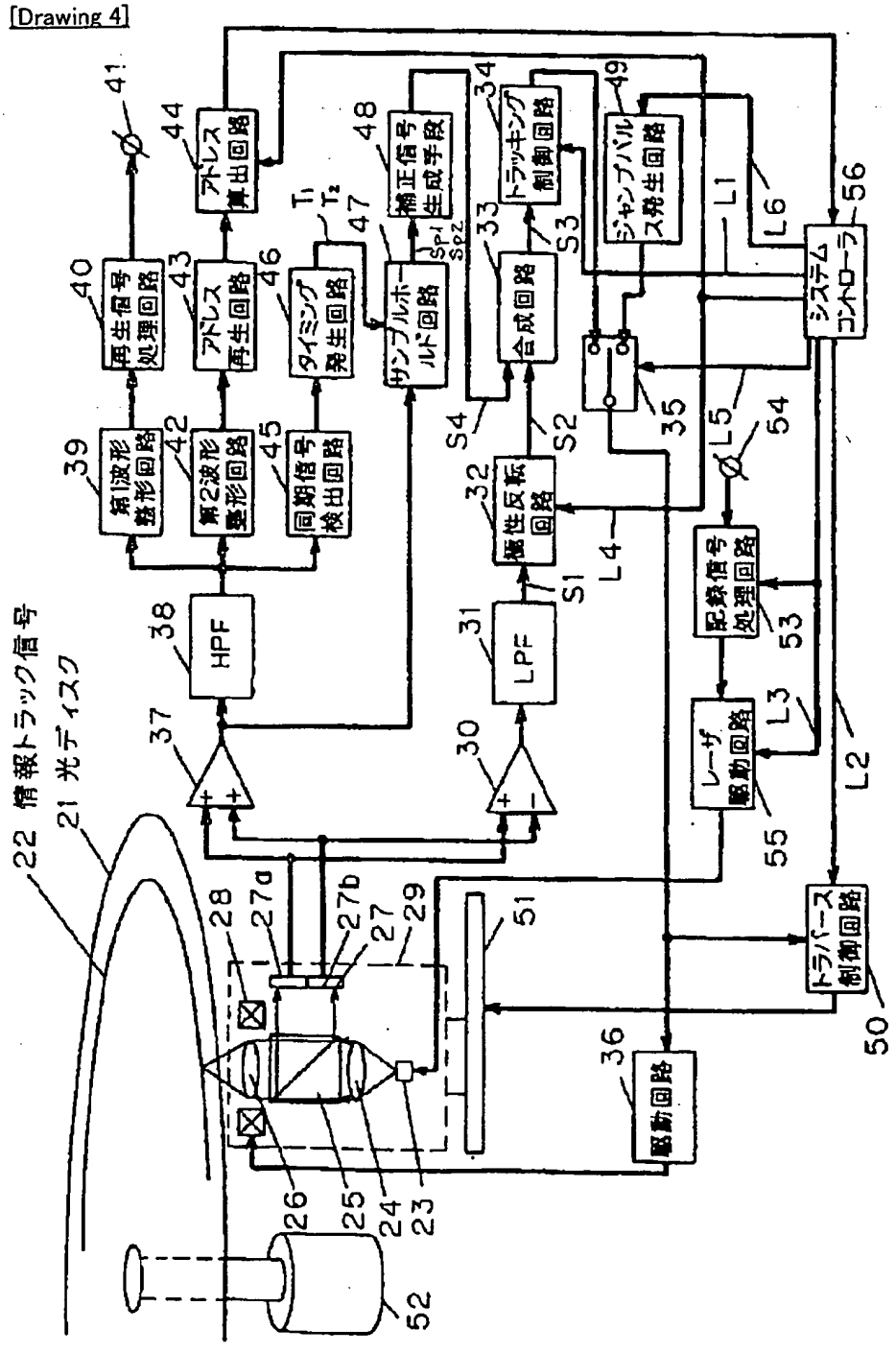
[Drawing 5]



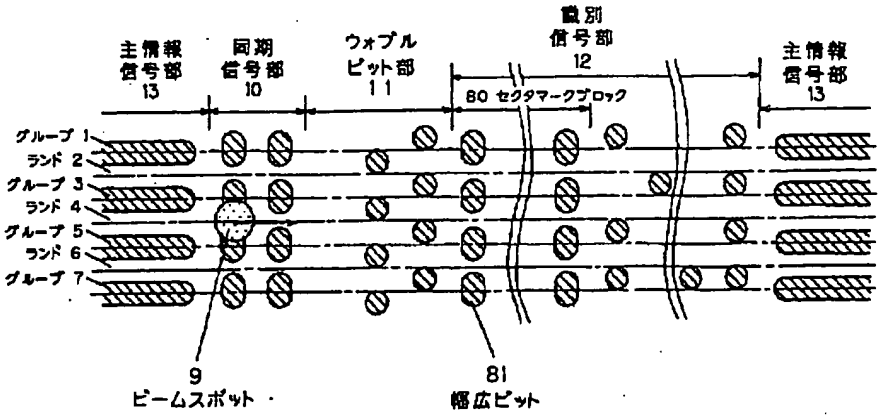
[Drawing 10]



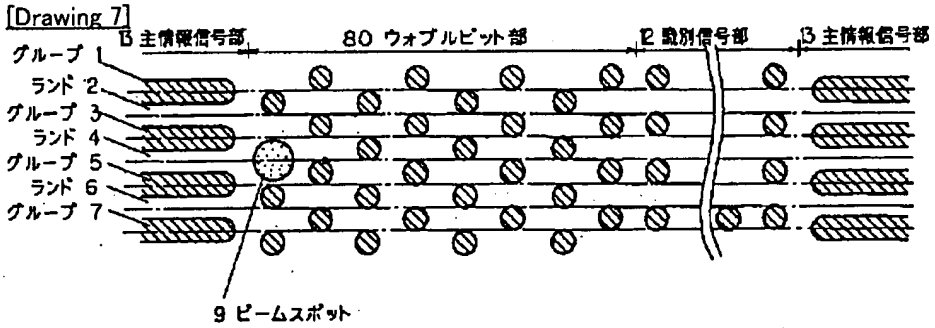
[Drawing 4]



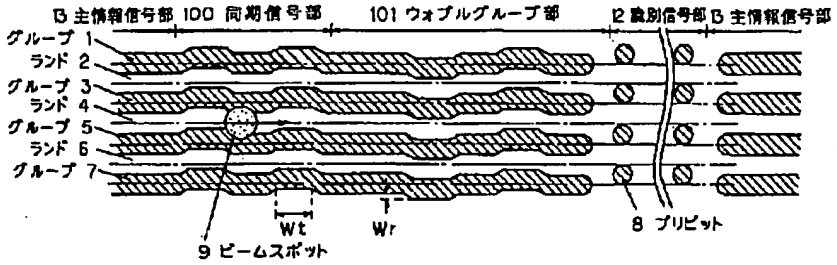
[Drawing 6]



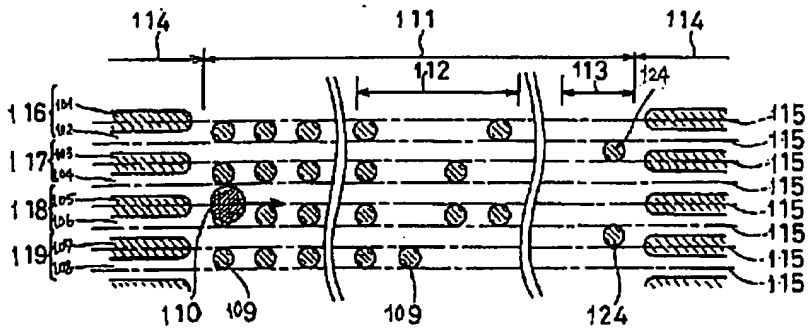
[Drawing 7]



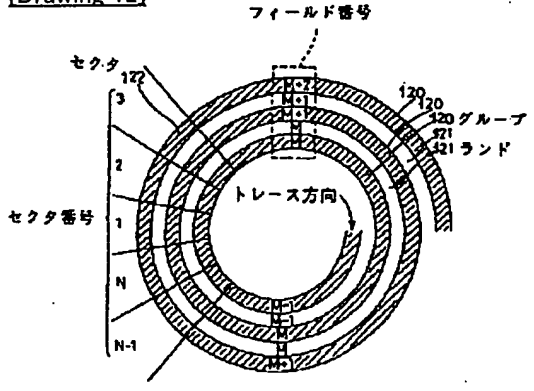
[Drawing 8]



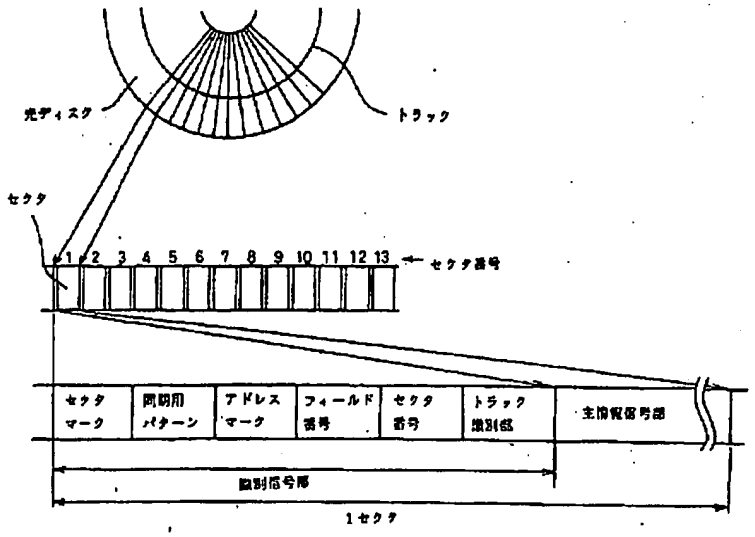
[Drawing 11]



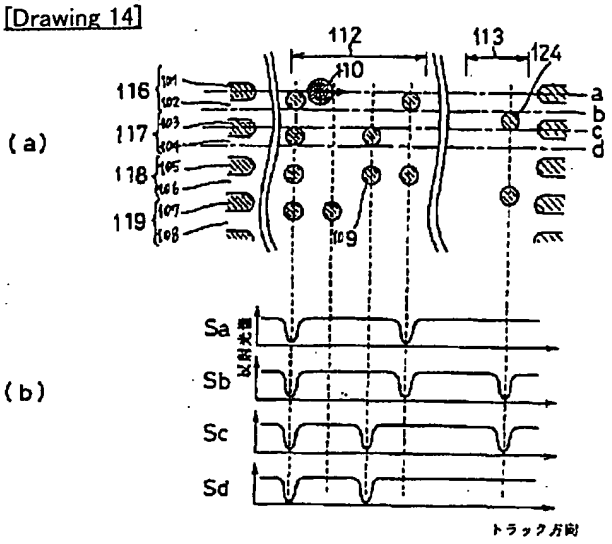
[Drawing 12]



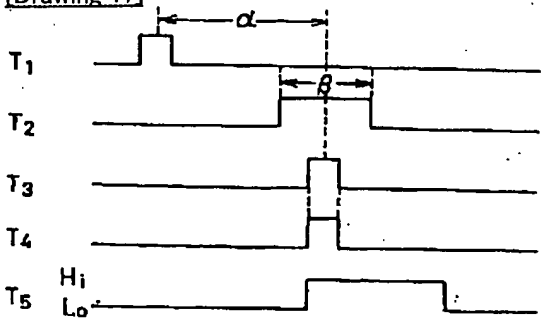
[Drawing 13]



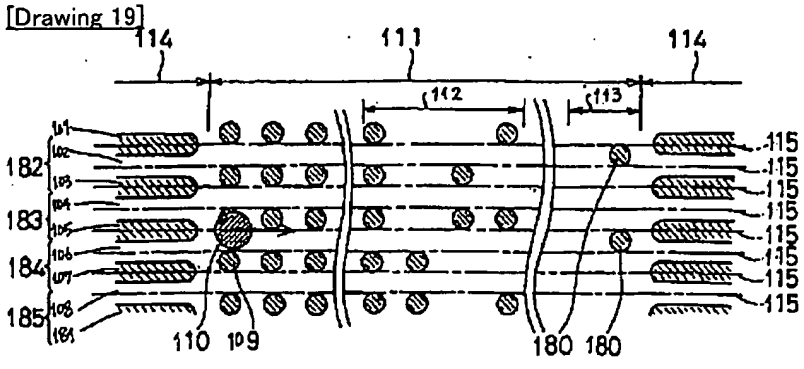
[Drawing 14]



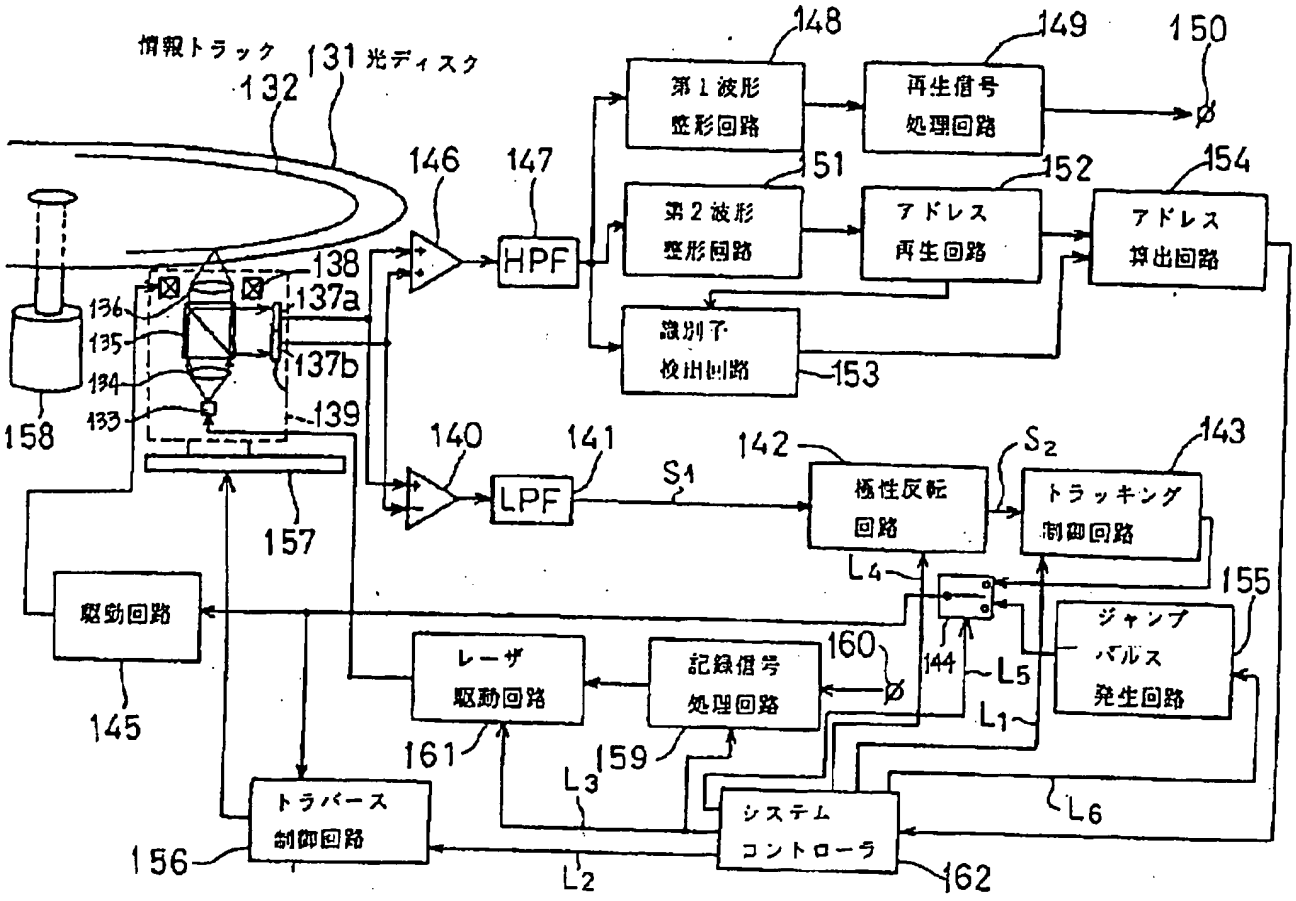
[Drawing 17]



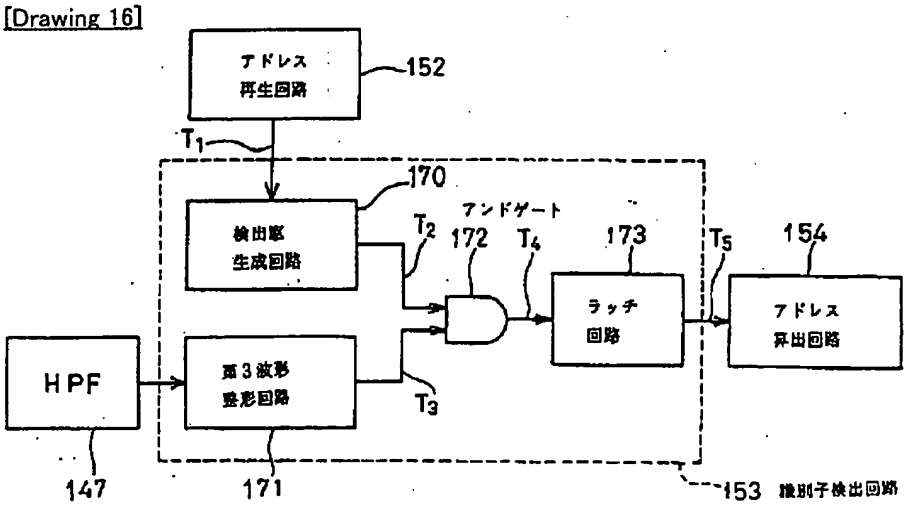
[Drawing 19]



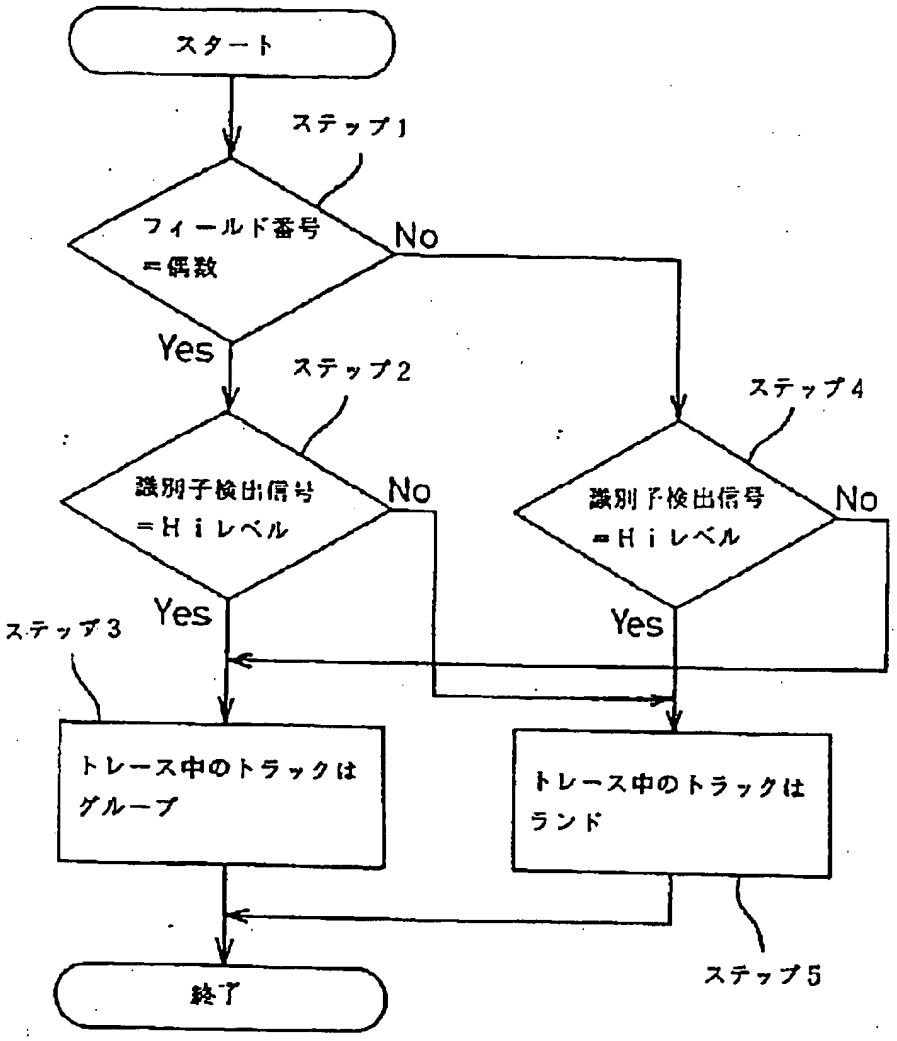
[Drawing 15]



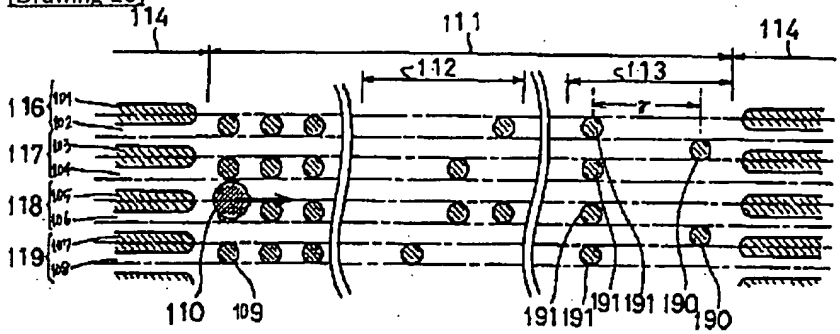
[Drawing 16]



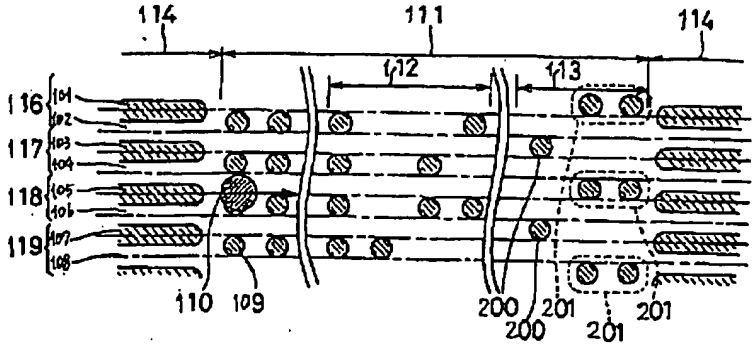
[Drawing 18]



[Drawing 20]

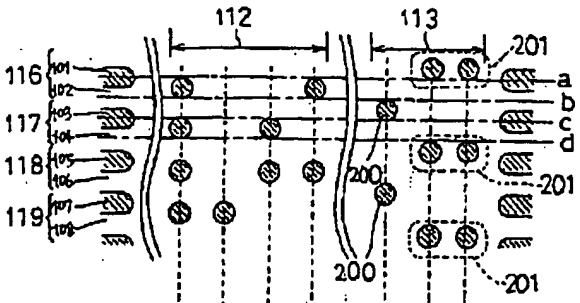


[Drawing 21]

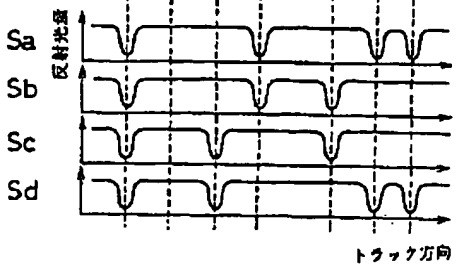


[Drawing 22]

(a)



(b)



[Translation done.]